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ABSTRACT

This document contains 7 of the 10 papers presented at the 1995 program of the American Educational Research Association's special interest group, Training in Business and Industry. The following papers are included: "A Multi-Disciplinary Approach to Integrating Evaluation and Training" (Jo D. Gallagher); "Comparing Managers and Employees in Team Environments" (Darlene F. Russ-Eft, Lilanthi P. Ravishankar); "Customer Satisfaction Research for Training Organizations" (Martin Mulder, Kemp van Ginkel, Wim J. Nijhof); "Evaluation of an Electronic Performance Support System for Instructional Design in Corporate Training Centers" (Kent L. Gustafson, Thomas C. Reeves, Malcolm L. Smith); "Toward Meaningful Evaluation of Manager Training in Technology-Based Companies" (Colla J. MacDonald and others); "Building Training on the Pillars: Applying Total Quality in the Classroom" (Jo D. Gallagher, Douglas H. Smith, and Ralph G. Lewis); and "Personnel Job Involvement and Organizational Climate Affect Transfer of Acquisition" (France M. Gauthier). Most papers contain substantial bibliographies. (MN)

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Evaluation, Team Orientation,
Customer Satisfaction,
Performance Support,
and Total Quality

Selected Research Papers 1995

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Selected Research Papers 1995

Martin Mulder (Ed.)

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Foreword

The 1995 program of the Special Interest Group Training in Business and Industry of the American Educational Research Association consisted of two paper sessions and one roundtable session, including a total of ten presentations. The papers that are presented are collected, and seven of these papers are selected for the proceedings. One presenter gave a presentation without having a paper, and two presenters were unable to attend the conference and to prepare a paper. That leaves seven papers that are included in these proceedings.

The papers address a wide range of topics in the field of training and development. The content of the papers reflects the developments and trends in the field of training and development: evaluation, team orientation, customer satisfaction, performance support, and total quality.

The 1994-1995 officers of the SIG were:

Olin J. Campbell, Vanderbilt University	-Chair
Martin Mulder, University of Twente	-Program Chair
Jo D. Gallagher, Florida International University	-Assistant Program Chair
Larry Dooley, Texas A&M University	-Secretary/Treasurer
Charles Duffy, Delgado Community College	-Newsletter Editor

The officers of the Special Interest Group on Training in Business and Industry hope that SIG members appreciate the fact that the SIG has started to publish proceedings of the program.

Martin Mulder
Enschede, December 1995

**A Multi-Disciplinary Approach to Integrating Evaluation
and Training**

Jo D. Gallagher

Jo D. Gallagher
Florida International University

How can evaluation be fully integrated into the programs and services offered by HRD departments as standard operating procedure? This author takes the position that the relevant knowledge in two separate fields quality improvement and innovation diffusion can be merged with training program evaluation to suggest specific activities in which HRD change agents might engage to achieve this goal.

The objective of this paper is to help human resource development practitioners solve a problem that exists in business and industrial training in particular, and in adult education in general; that of the treatment of program evaluation as an add-on activity, usually performed only at the request of someone outside the training organization. In many cases, the only evaluation data gathered stem from the "smile sheets" filled out by training participants at the end of a course that capture, at best, immediate reactions to the experience. This problem is not uncommon, and is not confined to evaluation. Training needs assessment appears to suffer the same treatment (Rossett, 1991).

If the general systematic training design process (which includes analysis, design, development, implementation, and evaluation) is compared with that of the continuous improvement process advanced by Shewhart (1931), better known as the Plan, Do, Check, Act (PDCA) cycle, several parallels can be discerned. For example, analysis and design are planning activities and evaluation is a checking activity. In considering the implementation of both processes in American industry in general, much emphasis has traditionally been on the action-taking parts (development and implementation; Do and Act) without much concern for planning and checking. It is no wonder then why training evaluation, embedded in the business and industrial context, is viewed as it is.

The consequences of this approach to evaluating training can be several. Consider the following scenarios:

1. Training programs in an organization are not evaluated at all, and unless there is a total breakdown in a classroom session which must be dealt with at the time it happens, little is done to improve training otherwise. The changes that are made in-session are not noted and not incorporated into further offerings of the course.
2. Data are collected by the training department but are not used to enhance programming. In some cases data are reported to an entity outside the training department (e.g., vice president of human resources) that may not do anything other than collect figures.
3. Evaluation, when it is performed, is done so as an afterthought, and less thoroughly than if planned along with the training it is to inform. Full benefits are, therefore, not realized for the costs involved.

4. Evaluation is performed in that data are collected and analyzed to discern necessary modifications which should be made to programs. The emphasis in the training department is heavily on the side of development, however, and few, if any, of the indicated changes are made. If anyone asks if programs are evaluated, staff can point to the data and reports of intended changes.

The adoption of total quality management (TQM) by an organization has changed this situation for the better in some cases. As some organizations have embraced TQM, some of the former operational emphasis on Do has spread to the other three phases and Action for improvement is taken based on data generated in the Check stage. It has been this author's experience, however, that the tremendous increase in training that occurs as a company adopts TQM tends to put even more emphasis on Do for the internal training unit because the demand for training comes from all over the company, not just from the incumbents in one job or even in a cluster of jobs. The press is to generate (buy, modify, create new) training that will enable all employees to function competently to implement (Do) the principles, practices, and tools of quality improvement. In some cases, this produces a situation similar to scenario number one, above. If this happens in organizations that follow the teachings of the quality gurus, what about the organizations that have not chosen to do so? They would appear to have even less of an incentive to evaluate their training programs. The situation is curious, given that most instructional design models include evaluation in one form or another. The problem is probably not, therefore, a lack of training on the part of the instructional development group.

If the lack of integration of evaluation and training is approached as a human performance problem, Leshin, Pollock and Reigeluth (1993) would suggest that if training in evaluation skills and knowledge is, indeed, not the solution, then the options include the following: (a) consider the incentive system, (b) consider making organizational changes, and (c) install a system to provide informational feedback. How then can program evaluation be built into the structure of the services a training unit provides to its constituent learners? The answer proposed in this paper was fashioned by combining knowledge gained from the research in two areas quality improvement and communication, specifically, innovation diffusion with training program evaluation. The relevant aspects of quality improvement and innovation diffusion are presented first, followed by a description of the components that form an integrated model with training program evaluation. For each component, its implications for practice are then presented.

Quality Improvement

Built on a foundation of its culture and values, a quality organization contains some key elements. Various authors have proposed their favorites, but there are some that appear consistently across the literature (Organizational Dynamics, 1988; Lewis & Smith, 1993). These key elements are the driving forces behind the various quality improvement movements regardless of their initials. A quality training organization would be well served to ensure that all its efforts, evaluation included, incorporate the following:

- Customer focus
- Total involvement
- Assessment
- Systematic support
- Continuous improvement

Customer focus refers to identifying and meeting the requirements and expectations of internal customers (other departments, employees, etc. within the company) as well as external customers (the ultimate recipient of the organization's product or service). The exchange of services, information, and so forth links internal and external customers together in a customer-supplier chain. This key element includes using a systematic approach to identify and meet the requirements of internal and external customers in such a way as to align what is produced with what is needed.

Total involvement means that everyone in the organization takes the responsibility for achieving quality; that it is not left to a select few or, perhaps worse, that no one is held accountable. It also means that all levels of the organization from top management to individual contributors are involved in achieving quality as it relates to what they specifically produce. This implies a respect for people closest to the work to make decisions that will ultimately insure customer satisfaction.

Assessment involves monitoring progress made toward quality goals taking baseline measures and keeping track. What gets assessed (called a quality indicator) is heavily related to customer requirements. Who does the assessing should be closest to the work being done to meet those customer requirements. This also includes the use of facts and data as the primary basis for decision-making and as input for further enhancement of services and programs.

Within any organization, the policies, standards, and decisions support efforts to one degree or another. To the extent that these follow a quality strategy, quality services will prevail. This systematic support also refers to recognizing and rewarding individuals who use a quality strategy to achieve goals and removing barriers that prevent or dampen the use of quality strategies and tactics.

In a total quality environment, continuous improvement becomes the prevailing mind-set; a continual striving to improve that which is produced, whether that is a trained employee, a strategy for recruiting employees, or even a staff meeting. The idea is to look inside the organization and elsewhere for benchmarks approaches or processes used to meet customer requirements that may be better than what is currently done. In this case, data gathered regarding quality indicators are analyzed for clues to improving the services to which they are related. This is done on an ongoing basis (e.g., through the PDCA cycle) as is communicating the successes of improvement efforts across the organization.

Innovation Diffusion

If evaluation of training can be viewed as a novel idea within the organization, or, if not a novel idea, one that has yet to gain wide adoption on a long-term basis, then the research on the diffusion of innovations can be brought to bear on integrating evaluation into the structure of training services and programs. Due to the limited scope of this paper, only the most salient points from the research will be made here.

Those who wish to forge this integration are change agents, and, as such, need to be prepared for the journey. Among other things, astute change agents know the following:

1. The process of innovation adoption, and that of change in general.
2. What and who adopters and opinion leaders are and how they facilitate further adoption.
3. How to use communication channels to foster adoption.
4. The various roles of the change agent.

Simply put, the adoption or rejection of an innovation takes place within the mind of an individual. The individual passes through five stages on the way to adoption, which can be thought of as full and ongoing use of an idea. Individuals within an organization may be at any one of these stages regarding the adoption of the idea of evaluation as part of the fabric from which training services and programs are fashioned. The stages in this adoption process (Rogers & Shoemaker, 1971) are as follows:

1. *Awareness* the individual learns of the existence of a new idea but has no information about it.
2. *Interest* the individual develops an interest in the new idea and searches for more information about it.
3. *Evaluation* the individual mentally applies the new idea to his or her present and anticipated future situation and decides whether or not to try it; the "Is there anything in this for me?" question.
4. *Trial* the individual actually uses the idea on a small scale to determine its usefulness.
5. *Adoption* the individual uses the new idea full scale and ongoing.

As with any innovation, there are those who adopt it early within the time span between first glimmer of an idea to full and widespread implementation and those who adopt it later, or in some cases, not at all. The earlier adopters, if they can be identified, are useful to the change agent. They are not necessarily any different than later adopters in age, but they tend to be less dogmatic and possess a greater ability to deal with abstraction. Within this earlier adopter category change agents will find a higher degree of opinion leadership and more social participation. Although not all early adopters are also opinion leaders, those that are can facilitate the adoption of an innovation by others because they are accessible and respected. People can and do talk to them, as well as listen to what they have to say.

A change agent's success is linked to many things, some of which are within his or her control. A short primer on change agency can provide some insight. First, a change agent's success is linked to working through opinion leaders. A change agent working alone will not succeed. As opinion leaders are also many times early adopters, they can be enlisted to carry momentum and persuade later adopters. Second, a change agent must use two channels of communication mass media and interpersonal for full adoption of an innovation. Mass media channels such as memos, flyers, newsletters, and formal written or oral announcements

at large gatherings are good for promoting awareness and changes in weakly held attitudes. Interpersonal channels, which involve face-to-face interchange between people, can help overcome some of the social and psychological barriers to change as well as persuade individuals to form or revise more strongly held attitudes. Third, an individual's satisfaction with an adoption decision is positively related to his or her level of participation in the decision-making. A savvy change agent will provide varied and numerous opportunities for people to get involved.

An Integrated Model and Its Implications

In order to take advantage of what is known from the research in quality improvement and innovation diffusion, this knowledge must be built into evaluation efforts. Fortunately, this can be done whether evaluation efforts are yet to be planned or exist in some manner currently. The first ingredient, however, is a solid approach to training program evaluation. Slick change agency aside, if the evaluation scheme is not a good one, few people will be convinced to use it; those that become convinced may not remain so for long.

The purpose of this paper is not to present yet another evaluation model, but to present components that, when considered as part of evaluation, facilitate the integration of evaluation into the structure of the services and programs that human resource development (HRD) departments provide (see Figure 1.1).



Figure 1.1 An Integrated Model of Evaluation

These components can be overlaid onto an evaluation model of the evaluator's creation or choosing and are designed to be used as tactics in the long-term strategy to foster adoption of the model to full and widespread use. There are already many good program evaluation models from which to choose. Popham (1993) has classified some of the major ones into the following categories: Goal-attainment models, judgmental models, decision-facilitation models, and naturalistic models. Whether the model selected is sophisticated and customized (Rendulic, 1994) or as straightforward as that of Craig (1978), it should be an articulated and agreed-upon plan for what will be evaluated, how it will be evaluated, to what audience(s) it will be reported, and how the information is to be used.

The approach proposed here is flexible enough to accommodate most any evaluation model and adds components favorable to structural integration with the system of training services to be evaluated. As the figure on the last page shows, the evaluation model is key. Four components surround and enhance the selected model based on the research. Each component will be discussed in turn.

Top-Down Support and Recognition

Time spent in program evaluation activities is time spent not doing something else. There must be some payoff or incentive for those engaged in evaluation. Although there may be some who derive intrinsic joy from this type of activity, more of us do things because we are externally rewarded for it in some way. This refers back to Leshin, Pollock and Reigeluth's (1993) first suggestion and to stage three of the innovation adoption process where the prospective adopter asks "what's in this for me?" If the answer to this question is "nothing" or "not much," then it is unlikely that program evaluation will be integrated. Top-down support and recognition can and should take many forms. Administrators, for example can drive fear out of evaluation by doing such things as the following: removing obstacles to data sources; encouraging the use of evaluation data for program and service enhancement; requesting that budget dollars be justified, in part, at least, by evaluation results; arranging release time for those heavily engaged in evaluation activities; instituting a policy of program review that requires decisions based on data rather than on managerial power plays. Recognition ranges from a simple pat on the back for a job well done to testimonial banquets and beyond. The key is to get support and recognition from high up in the organization and from the levels in between to the people doing the work. Depending on the culture of the HRD organization, recognition from peers can be a powerful reinforcer as well. This component, when present in the planning, delivery and evaluation of training can remove some of the social and psychological barriers to adoption and reflects the systematic support principle of quality.

Participation from Critical Mass of Stakeholders

In any evaluation effort there are many tasks to be done: planning, gathering and analyzing data, reporting, and decision-making to name just a few. If training programs and services are to be evaluated, then the people providing and managing these should be involved in that evaluation, perhaps with the technical assistance from others where necessary. This may sound like the fox guarding the henhouse, but it reflects the second key element of quality, total involvement, and fosters a mind-set of continuous improvement, the fifth key element. Also, when people in close proximity are working on some of the same things, interpersonal communication channels are used to exchange ideas. Earlier adopters can help later adopter types to acquire an interest in evaluation and assess its utility for themselves.

Participation does not mean that everyone does everything. This is why the component specifies a "critical mass." Critical mass is achieved when the major opinion leaders are involved and some of the skeptical have been convinced. At that point the effort begins to take on a momentum of its own. Trying out a selected evaluation model on a single training program gets a small number of people involved while providing feedback about enhancing not only the instructional program but also the evaluation process itself. From this trial run, participant evaluators can speak from experience about the process as they facilitate others to do it. Where possible, opinion leaders should be involved as data sources as well as participant evaluators to maximize impact on interpersonal channels of communication.

The first step in gaining participation is to determine what distinct tasks need to be performed. This may be as simple as looking closely at the evaluation process selected. The next step is to determine who is the best person for the task. "Best" can be defined as (a) can do the task, (b) is respected by peers, and (c) communicates well with others inside and outside the evaluation effort. It may be that the best "person" is actually a group. The third step is to start recruiting and getting people ready for the task(s) they are to do. It also helps to have several names ready in case the first choice declines or is otherwise engaged. One way to offer opportunities for involvement is to first form an evaluation model selection team. Once the model is chosen, another team can be formed to pilot it on one program where those associated with the program (e.g., designers and trainers) are willing. A third team can assess the utility of the evaluation model and modify it where necessary to permit wider use. The membership on these three teams may overlap to provide continuity. These tactics to gain participation may also be viewed as organizational changes to enhance human performance (Leshin, Pollock & Reigeluth, 1993).

The members of the teams should be prepared to participate. Change agents can provide the necessary training or briefing to ensure successful participation. For example, change agents may provide information about candidate models of evaluation such as features, expected impact, and how they work. They also may assist participant evaluators with creating data collection forms and interpreting the resulting data.

Multi-Referenced Interpretation of Evaluation Data

Many models for program evaluation are based on comparing actual performance with intended outcomes or goals. Their lineage dates back to Ralph Tyler and the Eight Year Study of the 1930s (Tyler, 1942). To put this into quality language, an organization would first determine its internal and external customers' requirements, which then would become its intended outcomes or objectives, and then measure its performance against them. This criterion-referenced approach to interpreting evaluation results is fitting and proper, as is norm-referenced interpretation, known in quality circles as "competitive benchmarking" whereby organization "A" examines organization "B" which offers a similar product or service and has a good reputation so that organization "A" can make its own operation better. For example, the training department from a transportation company may examine the training department in a nearby fast food corporation to gain insight as to how the transportation group could improve its distribution of and registration for non-classroom-based courses across the country. Data collected on the fast food training group would then be compared to that of the transportation group to give a norm-referenced view of how well it was doing compared to another training unit that had successfully faced a problem common to both units. Some may argue that if the customers' requirements are satisfied, there is no need to engage in competitive benchmarking. This view is limited, however. There may be other organizations that can reveal ways to save money, for example, while maintaining a high level of service.

A variation is to compare current performance against baseline data, collected at some earlier time. The baseline data provide the benchmark for comparison on critical quality indicators so that progress can be tracked. Of course, if no baseline data exist, they must be collected first.

Data-Based Continuous Improvement of Training and the Evaluation System

Michael Scriven gave the field of education the term *formative evaluation* (Scriven, 1967) to describe a focus of data-gathering designs and analysis techniques on the improvement of instructional sequences that were still under development. Scriven contrasted this approach with that of *summative evaluation*, which focused on determining the worth of completed instructional programs and sequences. The formative approach, proactive in nature, uses evaluation data to enhance in some way an already well-planned effort. This is similar to what is advocated in this component of the integrated model. This does not negate the utility of summative evaluation, but does point out the need for data-based decisions in pursuit of continuous improvement.

Both training and the evaluation system (model, process, etc.) are cited in the heading of this component section because both are important beneficiaries of evaluation data. Too often, however, the field of focus for evaluation and improvement efforts stops short of the evaluation system itself (meta-evaluation). As evaluation provides feedback to the rest of the overall system, it is part of that system and should be treated as such. This means that data must be collected about the evaluation efforts and those data used to enhance those same efforts. Following Fullam and Ponfret (1977), meta-evaluation during implementation of evaluation should focus on facilitating implementation and local system capabilities, rather than on judging the success or failure of the chosen model. For example, following a pilot evaluation of a sequence of sales training programs, a simple debriefing of the people involved revealed that some of the intended data sources were not used because few systematic records were kept by supervisors. This information became input for figuring out how to track past trainees so that future evaluation data-gathering efforts would be easier without overburdening supervisors. By using evaluation data to inform meta-evaluation, adoption of evaluation as an innovation is facilitated for those who were trial users (the people who had trouble tracking down past trainees) in the fourth stage of the adoption process and for those who remained skeptical until someone else field tested it. The model benefits from data-driven enhancements, thus making it more attractive to potential adopters who are in the second (interest) or third (evaluation) stage of adoption. Another way to approach the collection of meta-evaluation data is to hold a series of "what worked/didn't work" sessions both during and after evaluating a program or service. The members of the evaluation team thus become part of a focus group for enhancing not only their future efforts, but also the efforts of others.

As an element of systematic support, program reviews (cycles of program implementation, evaluation, and enhancement) can be scheduled so that data are gathered over a fixed period of time and are used as the basis for subsequent program enhancements. Consider a ten-day technical training course that is offered quarterly (February, April, June, and October). Evaluation data are collected over the year's term as the program is implemented and trainees go back to their jobs. Those data are then analyzed and interpreted following the October class and indicated changes are made before the February offering. Where multiple courses are offered, review cycles can be staggered so that the workload is balanced among course delivery, evaluation data gathering, and program revision. Where courses are offered more often, sampling procedures may be used for gathering data across the delivery term.

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**Comparing Managers and Employees in Team
Environments**

Darlene F. Russ-Eft & Lilanthi P. Ravishankar

Darlene F. Russ-Eft & Lilanthi P. Ravishankar
Zenger Miller, San Jose, California

Comparing Managers and Employees in Team Environments

This paper examines similarities and differences between managers and associates in team-oriented organizations. Eighty one managers and 364 associates from 10 organizations rated their job and organization. Also, self-directed work team experts rated the level of team orientation in these organizations. Organizations with high team orientation received more positive ratings by managers and associates. Furthermore, a multiple analysis of variance comparing managers and associates revealed ratings of managers and associates in more team-oriented organizations to be similar, and responses of managers and associates in less team-oriented organizations to be significantly different.

Employee involvement and teams have become one of the most common solutions to organizational issues such as productivity, cycle time and increased production costs. A large body of research has emerged about various aspects of team-oriented organization and employee involvement. Organizations have turned toward various forms of employee involvement for competitive advantage (Dumaine, 1990; Hoerr, Pollack & Whiteside, 1986; Hoerr, 1989; Lawler, 1986). Such employee involvement appears in the form of departmental problem-solving groups, cross-functional task forces, quality circles, and self-directed work teams. Many innovative ideas come from first-line supervisors and their employees. These ideas, when articulated, developed, and implemented, lead organizations to success. Current research recognizes that ordinary individuals make important contributions to organizations' success. Many such contributions come from groups of people, rather than individuals working in isolation. For example, Kanter (1983) depicted "corporate entrepreneurs," who work through participative teams to produce change. Although this research focuses on self-directed work teams, much of the discussion is relevant to the functioning of other types of teams, as well as the transition to teams.

We will begin with a definition of a self-directed work team. A self-directed work team is a group of 6 to 18 employees who are responsible for a defined part of a task. The task could be a final product, like an automobile, or a service, like the delivery of overnight packages. Every member of the team shares responsibility for the completed work. This can be viewed in contrast to the assembly line, where each worker is responsible for a specific, narrow part of the work. The team members set priorities, plan schedules, coordinate with others, give feedback, measure, and take corrective action. (See Orsburn, Moran, Musselwhite, & Zenger, 1990 for further definition.)

One branch of theory related to self-directed work teams arises from

sociotechnical systems theory. This was initially developed by social scientists from the Tavistock Institute of Human Relations in London. They reported on experiments with work groups undertaken in the British coal mines (Emery, 1959; Herbst, 1962; Trist & Bramford, 1951; Trist et al., 1963). Early work also occurred under the auspices of the Norwegian Work Research Institutes (Gulowsen, 1972, 1973). The theory emphasizes that both the technical systems (such as the machinery) and the social systems (such as social relations) interacted. Thus, effective job performance resulted when "joint optimization" of the sociotechnical systems occurred.

A second branch of theory focuses on the job and work-group characteristics. This approach focuses on the motivational, process, group, and organizational characteristics proposed as critical to group or team success. Leavitt (1975) initiated speculation on some of these characteristics in a review of the well-known Hawthorne studies at Western Electric Corporation. Hackman, as the major contributor to this theory, identified various characteristics (Hackman & Oldham, 1976; Hackman & Oldham, 1980; Hackman, 1982).

Both theoretical approaches provide us with insights as to factors critical for team success. First-level management practices appear critical in establishing and maintaining a new work structure (Cummings, 1978; Davis & Valfer, 1965; Griffin, 1981; Slocum & Sims, 1980; Susman, 1976; Wall, 1980). Groups are more effective when the members have the needed knowledge and skills (Goodman, Ravlin & Argote, 1986; Hackman, 1982; Hanna, 1991; Porter, 1990; Reich, 1991). Feedback and pay structures can impact teams (Hackman, 1982; Lawler, 1986). Team effectiveness improves when workers have control and responsibility for their work (Cummings, 1978; Cummings & Molloy, 1977; Gulowsen, 1971; Hackman, 1982; Hanna, 1991; Manz & Sims, 1987). Unfortunately, little empirical work has been undertaken to confirm these hypotheses.

More recently, however, Magjuka and Baldwin (1991a, 1991b) reported on an investigation examining seven variables: team size, team type, team rewards, team prestige, problem content, technological complexity, and benchmarking. These authors found that team type and degree of benchmarking significantly affected the effectiveness of the employee involvement program. In addition, Fandt (1991) compared selected teams of four to five members who were told that they were not accountable to their supervisors for individual or team performance with similar teams with higher levels of accountability. Teams with increased accountability showed more interdependence, higher success, and greater satisfaction. Cohen and Zhou (1991) found that both external and internal status affected team interactions. Ancona and Caldwell (1992) examined the differential effects of functional and tenure diversity on the performance of product development teams. Froiland et al. (1993) researched manager and non-manager attitudes to a move to team based environments. Frost (1994) examined differences in attitude among different roles to teamwork based organizations. Keszobom (1994) looked at conditions necessary for creating success in team based

environments from an organizational environment point of view. Scott and Townsend (1994) pointed to some evidence that employees (non-managers) in team environments feel more positive about their work. Tillsley (1994) conducted a study that examines employee attitudes to employee involvement.

Although gaining increasing attention, there remains a gap in the literature in terms of empirical research relating to work teams and factors critical for their success. There is also very little in the way of research with respect to attitudes of managers and non-managers in team environments and how such attitudes affect the way these groups respond to their work. Responding to competitive pressures, organizations are increasingly asking the questions: "Can we benefit from self-directed work teams? Will they work here?" Other organizations wonder if indeed team environments yield any benefits in terms of more positive attitudes towards work and higher levels of job satisfaction among employees both supervisory and non-supervisory. The present research was designed to illuminate some answers to these questions. In particular, the purpose of this study was to determine if managers and employees of organizations with a greater tendency to team orientation were more likely to have positive attitudes towards their work than organizations less oriented towards team functioning.

Study 1

Objectives

A team environment in organizations typically lead to a "flattening" of the hierarchy. In team environments, non-managerial associates assume increasing responsibilities. The gap between traditional managers and non-managerial employees tends to close in team-oriented organizations. This pushes greater decision-making power to employees who had little authority in more traditional settings. Consequently, employees have more ownership in their own jobs in organizations that are team-oriented. In this respect, managerial and non-managerial employees in teamed organizations have closely related roles in terms of authority and decision making power. Thus, we should expect to find fewer differences in the views of managers and employees. The purpose of this first study was to test this hypothesis.

Methods

Organizations

The organizations were self-selected in that they expressed an interest in determining the next steps in their plans to move to self-directed work teams in their organizations. Furthermore, each organization was willing to invest resources in terms of both time and money to gather information regarding their readiness to move to the next level of implementing work teams within their organizations.

The following (see table 2.1) are types of organizations included in this analysis that participated in the Feasibility Study process:

Table 2.1 Number of organizations included in the analysis

Manufacturing	8
Government agency	2
TOTAL	10

Subjects

Subjects were 81 managers and 364 non-managerial associates from 10 organizations.

Procedures

Within each of the 10 organizations, questionnaires were completed by separate groups of managers and non-managerial associates. Subjects were notified of the data collection effort in advance. Manager groups and associate groups met in selected rooms at specified times. Each group was greeted by the data collector and received the same instructions. Subjects were assured of confidentiality when compiling the data and were told that the data would be seen only in the aggregate. The data collector remained to answer questions from any of the subjects. Subjects left the room upon completion of the questionnaire. The data collector then gathered up the surveys and mailed them to a data analysis location.

Instrument

The questionnaire was designed to gather data regarding conditions on the job, as well as attitudes towards the work, the work group, the management, and the organization. It consisted of 242 statements. The statements were rated on a 7-point scale from 1 = "Strongly Disagree" to 7 = "Strongly Agree." These items were grouped under the following topics:

- Work Group Functioning
- Job Design
- System Functioning
- Manager or Supervisor
- Organization-Wide Management
- Pay System
- General Attitudes
- Job Reward Attitudes
- Pay Attitudes
- Performance Outcomes

In addition, subjects completed a series of demographic items.

Results

Comparison of Manager and Associates

We undertook a multiple analysis of variance to compare responses of managers and associates, as nested within organization, on each topic. The following (see table 2.2) showed significant differences between managers and associates:

Table 2.2 Significant differences between managers and associates

System Functioning	($F=4.61$, $df=9,18$, $p<.01$)
Organization-wide Management	($F=2.33$, $df=9,18$, $p<.05$)
Pay System	($F=1.91$, $df=9,18$, $p<.05$)

In terms of System Functioning, associates report less attention to rules and regulations, less stability in systems, and a lower level of information sharing than managers. In Organization-Wide Management associates provide lower ratings in terms of promoting participation, recognizing performance, consideration, and facilitating work through relationships, problem solving, and goal setting. Finally, associates are less likely to report that their pay is contingent on organizational performance, individual performance, group performance, or background and responsibility.

Such results led us to reject our first hypothesis. Managers do provide more positive ratings of organizations than associates even if the organization was implementing teams.

However, we decided that further investigation about attitudes between managers and non-managers was warranted. We wanted to investigate if any differences in team orientation among the organizations we studied, accounted for the differences between manager and non-manager attitudes. We decided to conduct further analyses after separating the organizations in the study into high or low team-oriented organizations. Even if the organizations in the sample had a stated intention to move towards work teams, if they were in different stages of implementation, it would be very likely that authority was not yet shared, and employees not completely empowered to make decisions in organizations.

Study 2

In the previous analysis, we found significant differences among many topics and factors for managers and associates. As a byproduct of the nesting, we also found significant differences among the 10 organizations. Differences among managers and supervisors may depend upon the degree of team orientation of the organization. If so, organizations with high levels of team orientation should receive more positive ratings by managers and associates. Also, there should be an interaction between team orientation and ratings by managers and associates.

Method

For this analysis, we obtained independent ratings of the 10 organizations that participated in Study 1 from four self-directed work teams experts. The experts were individuals who had worked closely with the organizations during some phase of the teams

implementation process within the organization. These experts used information from site visits or transcripts of interviews and focus groups as the basis of their assessment regarding the degree of team orientation within the various organizations. In-depth interviews were conducted with senior managers, line managers and non-managers within each of the organizations. In addition, these experts had access to mission and vision documents, business plans and goals, as well as budget information for team activities and training for each of the organizations. The inter-rater reliability of the ratings by the 4 experts ranged from .80 to 1.00, depending on the pair of raters. Thus, these experts were defining team orientation in a similar manner.

Results

Comparison by Level of Team Orientation

The next analysis consisted of a multiple analysis of variance comparing high or low team orientation. The results showed that organizations with high team orientation received more positive ratings by both managers and associates than did those with low team orientation. Selected results are shown below (see Table 2.3).

Table 2.3 Comparison of high and low team orientation

Topic	Level of Team Orientation		Multiple Analysis of Variance Results
	High	Low	
System Functioning	4.38	4.26	($F=4.86$, $df=1,401$, $p<.05$)
Pay System	4.39	4.31	(no significant differences)
Performance Outcomes	5.22	4.77	($F=30.58$, $df=1,395$, $p<.001$)

Such results support our hypothesis that organizations with high levels of team orientation receive more positive ratings by both managers and associates.

Comparison of Managers and Associates by Level of Team Orientation

The final analysis consisted of a multiple analysis of variance comparing managers and associates in organizations with high or low team orientation. The results were not consistent across the topics. Therefore, we have listed selected topics under the three different types of results (see Table 2.4).

Table 2.4 Comparison of managers and associates

	Topic	Level of Team Orientation		Multiple Analysis of Variance Results
		High	Low	
1.	Manager or Supervisor			(F=9.19, df=2,400, p<.001)
	Managers	5.29	4.67	
	Associates	4.89	4.05	
	Pay System			(F=8.21, df=2,401, p<.001)
	Managers	4.59	4.82	
	Associates	4.34	4.20	
	Job Reward Attitudes			(F=7.07, df=2,398, p<.001)
	Managers	5.64	5.57	
	Associates	5.40	5.12	
	Performance Outcomes			(F=6.07, df=2,395)
	Managers	5.34	5.13	
	Associates	5.19	4.69	
2.	System Functioning			(F=7.60, df=2,401, p<.001)
	Managers	4.47	4.05	
	Associates	4.27	4.26	
3.	Pay Attitudes			(no significant differences)
	Managers	4.28	4.32	
	Associates	4.24	4.12	

1. For these topics, managers and associates in organizations with high team orientation did not differ significantly in their ratings. In contrast, managers and associates in organizations with low team orientation did differ, with managers providing more positive ratings than associates.
2. In the following topic, managers in organizations with high team orientation provided more positive ratings than did associates. In contrast, managers in low team orientation organizations gave less positive ratings than did associates.
3. In the following topic, no significant differences emerged between managers and associates based on team orientation.

Discussion

The results from the two studies undertaken here lend some credence to the assertion that teams are a viable way of organizing work. The first study indicated that when grouped together, organizations with high and low orientation showed that there were significant differences between manager and non-manager attitudes to work (even when the organizations were probably more team-oriented when compared to other more traditional work environments). The gaps between attitudes closed to some degree when we separated the organizations with high and low team orientation.

These results indicate that clearly, teams have a significant impact on organization climate. The more positive attitudes of both managers and associates in team-oriented organizations may be attributed to the "flattening" of the hierarchy in such organizations. In such environments, associates assume increasing responsibilities and are empowered to take ownership of their work, which in turn leads to more positive attitudes about their organization.

Possible reasons for more positive attitudes of managers in team-oriented organizations are less obvious, since they do have autonomy even in less team-oriented organizations. However, it is likely that in more team-oriented organizations, managers are also empowered to a greater degree by their own superiors, thus making their work more rewarding. Furthermore, employee empowerment would presumably free managers from having to "micro-manage" their employees, and also concentrate less on the more tedious types of administrative activities thus allowing managers to focus on more meaningful long term activities rather than merely supervisory activities.

Appendix A

Work Group Functioning

- I feel I am really a part of my work group.
- There is a lot of group spirit.

Job Design

- I get to do a number of things on my job.
- I have the freedom to decide what I do on my job.

System Functioning

- Rules and regulations are pretty well enforced.
- Systems are well documented.

Manager or Supervisor

- My manager encourages people to participate in important decisions.
- My manager demands that people give their best effort.

Organization-wide Management

- Organization-wide management rewards people who do something well.
- Organization-wide management keeps everyone informed.

Pay System

- I have a real understanding of how the pay system works at our organization.
- My pay level is determined by my individual job performance.

General Attitudes

- I like working here.
- What happens to this organization is really important to me.

Job Reward Attitudes

- It is extremely important to me to have chances to learn new things on my job.

Pay attitudes

- I am very happy with the amount of money I make.
- I am content with the way the management handles pay.

Performance Outcomes

- People pay a lot of attention to getting work done.
- This is a highly efficient, work-oriented place.

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Customer Satisfaction Research for Training Organizations

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In order to retain their market shares, training organizations are striving to systematically improve their quality. Various methods have been developed for the maintenance and improvement of quality. One of these is customer satisfaction research (CSR). During the years 1993 and 1994 the University of Twente and the VETRON developed, implemented, and evaluated a system for CSR for training organizations.

This paper goes into the reliability of the CSR system, the stability of the total satisfaction indicator (TSI), and explores the question as to what variables predict the level of customer satisfaction for training projects. In the first part of this article is described what CSR exactly is, and why it is important for training organizations. Next, the research questions, the survey design, and the sampling will be described. Then, the research results will be presented. Subsequently, conclusions about the CRS system will be drawn. Finally, the limitations of this CRS system, and applications for training organizations will be discussed.

What is Customer Satisfaction Research?

Customer satisfaction research for training organizations is a tool for marketing and quality management. It is applied to get an quantified impression about the quality of the service delivered by the training organizations from the perspective of their clients. And it consists of a survey in which the satisfaction with various elements of the service provided is measured. The main concepts in this tool are 'customer', 'satisfaction', and 'research'.

The customer of training organizations is not the recipient of the service of the organization. It is the client who purchases a training program, who signs the contract with the training organization, and who is responsible for the budget for the training program. In most cases the customer of training organizations is the training project manager in the client organization. The customer is the person who is best informed about the relationships between the performance objectives of the training program for the trainees, and the wider performance goals of the training program within the organization. The customer controls the link between the micro level of the training program and macro level of the team or the department in which the trainee is working, or the organization that needs the benefits of the training program. The customer can be a participant in the training program, but that is not necessarily the case. It happens for instance that when supervisors purchase a program on team building, that they also participate in the program.

Satisfaction is not synonymous with the reaction evaluation level, distinguished by many authors (Hamblin, 1974; Kirkpatrick, 1987; Phillips, 1991). Satisfaction

with training projects is related to the question as to whether the customer expectations are being met. This means that the thinking of CSR starts with customer requirements and objectives customers have with the training projects (Swanson, 1994). Customer expectations regarding training projects involve expectations about learning results, performance improvement in the workplace and improvement of organizational performance. The satisfaction about these results, however, has to be interpreted in the light of the objectives of the client organization and the responsibilities of the training provider. For clients can have various reasons to purchase training programs, and the level of responsibility of training organizations for the training results can vary. The higher the level of training project objectives, the higher the level of involvement of the client organization, and the more responsible the client organization is for the results. For instance, it is hard to hold training organizations accountable for realising organizational redesign by means of a training project. A training project can support organizational redesign, but the client organization itself needs to implement all kinds of other measures for establishing the redesign required. In many in-company training projects training providers and client organizations have a shared responsibility for the training results. Because of the varying levels of objectives and involvement of client organizations, the interpretation of the satisfaction with the results of the training program has to account for differences in objectives and responsibilities.

CSR is a form of empirical research. In the case of this study, it is a research project for an association of training organizations. This association consists of about 45 training corporations. These training organizations are competitors, but they collectively market their products and services, and defend their interests in the training market. Together they serve over 6,000 clients a year with in-company training programs, in which over 100,000 persons are enrolled. A stratified weighted sample is drawn from the client lists of the training organizations. The clients that are drawn in the sample receive a standardized questionnaire, and they are called for a Computer Assisted Telephone Interview. An independent research institute conducts the project. This gives the opportunity to process the questionnaires anonymously, which is important because clients are more objective in anonymous surveys. From market research it is known that customers hardly complain when they are dissatisfied with goods or services they purchased, they simply choose another provider.

Why Customer Satisfaction Research?

CSR serves two functions: it is a marketing tool and a tool for quality management. It can be employed by associations of service organizations, but the organizations themselves can also use it. The association of training organizations in this case, uses CSR as

one of the conditions for membership in the association, and as one of the systems for quality control. Contracting CSR with an outside independent research institute is one of the registered sales conditions, and serves as a warrant for quality service and professionalism provided by the member organizations. The mere fact that CSR is conducted within the association has marketing value, but the results of the CSR may also convince candidate clients that they are dealing with quality training providers.

Individual training organizations can use the results of CSR for their internal quality improvement. Analysing trends in satisfaction ratings over a certain period of time, comparing satisfaction ratings with the mean satisfaction scores (across the association), and the ranking of other training organizations, stimulates directors of training organizations, their trainers and consultants to pursue excellence in their professional service. It furthermore creates energy if change is needed.

CSR Instrument

In the social sciences, diverse methods and techniques have been developed for determining the satisfaction of a client about a product or service. The questionnaire is one of the most common of these methods (Hayes, 1992).

The basic purpose of the questionnaire is not only to examine a series of aspects about which the client and the training organization have made agreements, and to which degree the client is satisfied with the performance of the training organization. It is also the intention to obtain an indication of the results of the training activities of the client and the training organization. The first level of Kirkpatrick (1987), the reactions of training participants, are irrelevant with regard to determining the results of the training program and the satisfaction about the training from the perspective of the customer. This, however, is not to say that the satisfaction of the training participants is unimportant. This is certainly not the case. However, in the framework of CSR, learner satisfaction is seen as a contributing factor to the actual result for which much in-company training strives: the manifestation of learning results, work effects and benefits for the organization (Brinkerhoff, 1988; Games Robinson & Robinson, 1989).

There are eight question blocks in the questionnaire, with a total of 18 questions and subquestions. Almost all questions are closed. The questions deal partly with facts and partly with perceptions. The instrument is structured as follows:

-
- I *General questions*
About the role of the contact person, the job of the contact person, and the general level of satisfaction with the training project.
- II *Questions about the training*
About the subject matter, the number of times that the training was conducted, the number of days of training, and the number of persons who participated.
- III *Objectives*
This block asks whether training objectives were formulated, the degree of specificity of these objectives, and the degree to which the training was intended to lead to learning results, changed working behavior, or the support of organizational change.
- IV *Responsibilities*
This block asks whether agreements were made about the division of responsibilities between client and training organization, and, if so, to which degree the training organization was responsible for the realization of the objectives. This question is related to the fact that for much training, both client and training organizations are responsible for the realization of the objectives of the training program.
- V *Results*
This block asks whether the results of the training project meet the expectations, and to which degree the objectives have been met.
- VI *Attribution*
This block asks the degree to which the success or failure of the training project can be attributed to the training organization.
- VII *Agreement and their fulfilment*
The questions in this block deal with the various agreements which may have been made about the contract between the client and the training organization. This concerns the training activities, the pre-, and post-training activities, and the administration. The question is asked as to which agreements have been made, and to which degree they have been fulfilled.

- VIII *Contact with employees of the training organization*
The names of the people with whom the contact person has had contact and judgements about each of these persons, are requested.
The questionnaire is completed with an open question, soliciting comments about the way the training service was delivered.

Question blocks I and V contain questions about the results of the training project, and blocks VI, VII, and VIII contain questions about the performance of the training organization. Most of the questions about training results and provider's performance are of the ordinal level.

Research Questions, Variables, Research Procedure and Methods

In this study the quality of several components of the CSR system are scrutinized. First of all, the reliability of the CSR system is evaluated. Questions in this respect are: Does the satisfaction of non-respondents with their training projects significantly differ from the satisfaction of the group of respondents? Does re-rating the satisfaction with training projects by the respondents result in significant differences with the first ratings? And does the rating of second raters of the satisfaction with training projects result in significant differences with the ratings of the first raters of these training projects?

Secondly, in the CSR system, one criterion variable plays an important role. This is the 'Total Satisfaction Indicator' (TSI). It is an expression of the total satisfaction of the client with the comprehensive training program, which includes the front-end stage, the implementation of the training program, and the results of the training program. TSI is measured on a 10-point scale. The training organizations are ranked according to their mean score and standard deviation on TSI. Therefore it is essential to measure the stability of TSI. This is possible because there are other criterion variables with which TSI can be compared. The question is whether TSI differs significantly from other criterion variables. Apart from TSI, the following criterion variables are distinguished:

- *Goal fulfilment:*
This is an indicator of the degree to which the objectives of the training have been reached; it is an ordinal variable, and has a range of 1-5.
- *Meeting Expectations (abbreviated as ME):*
This is an indicator for the fact whether the results of the training conform to the expectations of the contact person; this is a dichotomous variable, but in the second measurement period (see below) this variable was transformed into an ordinal variable.
- *Effect attribution:*
This is an indicator of the degree to which the results of the training program are attributed to the effort of the training organization. The effect attribution can have two meanings, depending on whether the customer perceives that the training project fulfilled the expectations. If this is the case then the effect attribution indicates the degree to which the customer attributes the accomplishment of the objectives to the training organization. If this is not the case, and the results are disappointing, then the effect attribution indicates the degree to which the customer attributes disappointing results to the training organization. The effect attribution is an ordinal variable, with a range of 1-5. A high score with a positive effect attribution indicates that the customer strongly attributes accomplishing the objectives to the training organization. A low score with a negative attribution indicates that the disappointing results are not or only slightly attributed to the training organization.

Thirdly, it is interesting to analyse variables that determine total satisfaction of customers with training projects. This analysis may result in guidelines for training organizations to improve their customer satisfaction ratings. The predicting variables are:

- *Determination of objectives:*
This indicates whether objectives were determined for the training program; this is a dichotomous variable.
- *Specificity of objectives:*
This variable indicates the degree of specificity of the objectives; it is an ordinal variable with a range of 1-5.

- *Importance of objectives:*
This variable indicates the importance of the objectives of the training project and is divided into three subvariables which are related to the nature of the training program; these are: 'learning results', 'working behavior', and 'organizational change'; this is an ordinal variable with a range of 1-5.
- *Responsibility of training organization:*
This variable indicates the degree of responsibility which the training organization had for reaching the objectives at the levels of learning results, working behavior, and organizational change; it is an ordinal variable with a range of 1-5.
- *Agreement reliability:*
This variable encompasses 12 subvariables (which are clustered in four groups: the three phases of the in the training program and the administration) which indicate the degree to which the training organization fulfilled the agreements which it made; the subvariables are ordinal with a range of 1-5.

Four samples have been drawn for two measurement periods (see Table 3.1 for details about the size of the samples). Training projects were evaluated that were finished in the period from August 1st, 1993 to December 31st 1994 (the second half of 1993, abbreviated as 93-2), and from January 1st 1994 to July 31st 1994 (the first half of 1994, abbreviated as 94-1). Client lists were collected, and samples were drawn from these lists. The sample size for 93-2 was five clients for each training organization. The sample for 94-1 was weighted by the amount of projects by organization, which varied from three to over one hundred. The maximum sample size per organization for 94-1 was thirty clients. Three training organizations did not send their client list to the research institute. The training projects in 93-2 of these organizations were inserted in the 94-1 evaluation period. But the data of these three organizations were not included in the stability testing of the TSI indicator. So, whereas the total response for the main sample for 93-2 is 349, the number of projects for which the stability of TSI for 93-2 is tested is only 312.

Table 3.1 Sampling and participation of respondents

Samples	Population of projects	Sample size	Response group size	Response %	Response % of sample of population
Main sample					
93-2	2444	472	359	76	15
94-1	3785	766	501	65	13
Total	6229	1238	860	71	14
Non respondents					
93-2		32	14	44	
94-1		75	34	45	
Total		107	48	45	
Re-raters					
		32	16	50	
93-2		75	45	60	
94-1		107	61	57	
Total					
(Second) raters					
93-2		16	6	38	
94-1		45	15	33	
Total		61	21	34	

For the 93-2 non-response analysis, a sample of about one person per training organization from the non-respondents was drawn. Non-respondents are persons who did receive a copy of the questionnaire, who were telephoned, but who (mainly for time pressure reasons) refused to participate in the study. The sample of non-respondents was called again. They were asked to answer two questions in a short version of the original questionnaire: one for the TSI, and another for the EM variable. But as could be anticipated, most of the non-respondents who were not willing to cooperate in this study, were not willing either to participate in the non-response study. Therefore the sample size of non-respondents for the 94-1 period was set at 75. The satisfaction ratings of the participating non-respondents are compared with the ratings of the total group respondents.

Re-raters are persons from the original sample, who immediately participated in the study, who completed the original questionnaire, or were interviewed on the telephone, who also participated in a re-rating of the satisfaction with the training program. For this group, for 93-2 the same amount of persons were sampled as was done for the non-respondents group. The willingness to participate in the test-retest study was also limited, therefore the number of re-raters for the 94-1 period was also set at 75. The short version of the questionnaire was also used for this group. The satisfaction ratings of the group of re-raters is compared with their initial ratings.

Re-raters were asked to name persons for a second rating of the satisfaction with the training project. All persons who were involved in the re-rating study named second raters. The second raters were telephoned and the questions from the short version of the questionnaire were asked. The satisfaction ratings of the second raters are compared with those of the first raters of these projects.

Relationships or differences between variables and groups are tested with t-tests, McNemar tests, Spearman rank correlation coefficients, Mann-Whitney-U tests, and Kruskal-Wallis tests.

Results

This section will deal with the results regarding the reliability of the CSR system, the stability of the TSI indicator and the prediction of the TSI value.

Non-response research results

From the results of period 93-2 (see Table 3.2) it appears that the average score of the non-response group for TSI is 7.71, for the response group that was 7.57; this is just a small difference, and has a conservative effect on the research results. The results for the question as to whether the results of the training program meets the expectations (ME) is almost identical for the response and non-response group. For this question, 83.0% of the non-respondents answered negatively, while this figure was 83.9% for the response group.

Table 3.2 Non-response research results

		93-2	94-1
TSI	Average total	7.57 ¹	7.75 ¹
	Average non-response	7.71	7.38
SE	Average total	83.9 % ²	4.09 ³
	Average non-response	83.0 %	4.34

- 1 The degree to which respondents are satisfied with the training project
(1 = minimum satisfaction; 10 = maximum)
- 2 The percentage of respondents whose expectations were met by the training project
- 3 The degree to which the training project met expectations
(1 = minimum; 5 = maximum)

From the results of period 94-1, it is apparent that the average score of the non-response group for TSI was 7.38, for the response group this was 7.75; this is also only a small difference, but it indicates an overly positive result for TSI among the response group. In period 94-1, ME was measured with an ordinal scale (from 1 to 5). This was a question as to the degree to which the training program satisfied the expectations. The result of this question was also somewhat higher for the non-response group (4.34) than for the response group (4.09). This result indicates a slightly underestimated result from the response group, in this case for ME variable, and matches with the conservative estimation of the TSI variable for the first research period.

The differences between the observed research results are so minimal that the results of the response group can be considered to be representative (at least if the sample of non-respondents is taken as representative for the entire group of non-respondents). However, research encompassing larger groups of non-respondents would be necessary in order to demonstrate whether this conclusion is justified.

Test-retest reliability

TSI was compared for both measurement periods, original ratings, and re-ratings of re-raters (see Table 3.2).

Table 3.3 Test-retest research results (number of research units between parentheses)

	93-2	94-1
TSI Average total of selected raters	7.63 (16)	7.67 (45)
Average of re-rating	8.00 (16)	7.82 (45)

From t-tests of matched pairs in both research periods, it appears that both observations do not significantly differ ($p_{93-2} = .138$; $p_{94-1} = .227$).

Subsequently, for the first period, the difference between the two measurements was examined concerning the question as to whether the results of the training project met the expectations. From a McNemar Test for testing the differences between groups, it appears that the observations do not significantly differ from each other ($p = .250$). Because of a technical difficulty in the test-retest reliability, it was not possible to conduct the analysis for 94-1. This was because the psychometric nature of the variables of the first and second rating was different.

The research results lead to the conclusion that the customers overwhelmingly gave the same ratings of their satisfaction with the training project for the mentioned variables, during the re-rating. This leads to the conclusion that the test-retest reliability is sufficient, unless further research among larger number of customers, contradicts this conclusion.

Inter-rater Reliability

Because of the followed procedure, the number of second raters was even smaller than the number of re-raters. As mentioned above, the re-raters were asked to give the names of possible second raters within their organizations. There were 16 re-raters for 93-2 and 45 for 94-1. Of this number only 6 and 15 people, respectively, could give names of people who could be approached for information about the training program. The other customers said that there was no other person in their organization with as much information about the training project as they themselves had.

The TSI variable was measured for both research periods using the same scale. That was not the case for the SE variable. This was measured as a dichotomous variable for 93-2 and as an ordinal (minimum = 1; maximum = 5) variable for 94-1. The results are presented in table 4, with the exception of the results for the SE variable for 93-2. Because of their small number, those data were qualitatively analysed.

Table 3.4 Research results inter-rater reliability (number of research units between parentheses)

	93-2	94-1
TSI Average selected raters	7.50 (6) ¹	8.07 (15) ¹
Average of second raters	7.67 (6)	7.87 (15)
SE Average selected raters		4.09 (11) ²
Average of second raters		3.82 (11)
1	The degree to which raters are satisfied with the training project (minimum satisfaction 1; maximum 10)	
2	The degree to which the training project meets the expectations (1 = minimum; 5 = maximum)	

From the results for 93-2 (see Table 3.4) it appears that the average rating of the second raters for TSI is 7.67, for the corresponding selected raters this was 7.50; this is a small difference, which indicates an underestimation of the research results for the response group.

The results of the question as to whether expectations about the training project were met, are intriguing. Three of the six second raters gave a different answer for this than did the raters. At first sight this seems worse than it is. Further analysis of the TSI, and the question of whether expectations were met, showed that for the first pair a one point difference (a 9 from the customer and an 8 from the second rater) is enough for a difference between positive and negative judgements as to whether expectations were met. This is so, even though 8 indicates a high level of satisfaction. The second pair showed a difference of 2 points (a 6 and an 8, respectively). Such a difference is in any case easy to interpret: the customer and the second rater did not agree. The third case involves both raters giving a 6. They apparently have different norms for the acceptability of norms.

It is interesting to look in this qualitative manner at the results of this reliability analysis. It is still too early to make definitive conclusions, but the results can play an important role in the conducting of future research among a greater number of second raters. In this case the second raters should be critically examined to determine the extent to which they are informed about the relevant training. A further possibility is to ask the training organization who might be good candidates for a second opinion.

From the results for 94-1 it appears that the average rating of the second raters for TSI is 7.87, for the corresponding selected raters this was 8.07; this is also a small difference which indicates an overestimation of the research results for the response group

For the SE variable, the opposite effect was found. The value which was found for the second raters is 3.82, and 4.09 for the customers. This indicates a slightly overestimated outcome of the research results for the overall response group.

From the results of the overall inter-rater reliability research, it can be concluded that there are small differences between raters and second raters, which at times show overestimation and at times underestimation of the results of the research. The differences were compared using t-tests and matched pairs signed ranks tests, and none of these were statistically significant.

Stability of TSI

The value of TSI is compared with the values of the other criterion variables (see Table 3.5). The Spearman (rank) correlations between TSI and the degree in which the objectives for 'learning results', 'work behavior' and 'organizational change' are reached, are statistically significant (except for TSI and reaching 'organizational change' for 93-2; for that correlation the p-value is less than .10).

In other words: there is a large degree of internal consistency between answering patterns for TSI and the degree of objectives reached as criterion variables within the CSR system.

The positive and negative effect attributions with regard to the objectives that are reached for 'learning results' and 'working behavior' are significantly correlated with TSI. However, the p-values of the correlations between the positive and negative effect attribution for the objectives reached for 'organizational change' and TSI are less than .20. The values of the negative attributions for the three relevant objective categories are indeed negative. This means that the training organizations, in general, are not or hardly held responsible by the customers for the disappointing results. Apparently, the client organizations had to perform better than they actually did, or other circumstances caused the disappointing results for which neither the training organization, nor the client organization could be held accountable.

For the 94-1 period, satisfaction with the delivery of the service of the training organizations on various elements of the service was measured. As is the case for the various agreements that can be made between both parties, the service elements were categorized into issues relating to the pre-training phase, the training implementation phase, the post-training phase and the administrative regulations. As can be seen from table 5, all satisfaction ratings for the service issues correlate significantly with TSI.

Therefore, it can be concluded that TSI is a rather stable indicator for the degree of satisfaction with the service provided by training organizations.

Table 3.5 Spearman rank correlation coefficients (R_s) and probabilities of significance between Total Satisfaction Indicator (TSI) and other criterion variables for both samples 93-2 ($n = 312$) and 94-1 ($n = 501$)

Criterion variables	R_s (93-2)	R_s (94-1)	Prob (93-2)	Prob (94-1)
Degree objectives reached				
Learning results	.38	.28	$P < .001$	$p < .001$
Work behavior	.24	.19	$P < .001$	$p < .001$
Organizational change	.15	.31	$p < .10$	$p < .001$
Positive effect attribution				
Learning results	.25	.23	$p < .001$	$p < .001$
Work behavior	.19	.20	$P < .01$	$P < .005$
Organizational change	.14	.14	$p < .10$	$P < .10$
Negative effect attribution				
Learning results	-.64	-.84	$p < .001$	$p < .001$
Work behavior	-.43	-.76	$p < .01$	$p < .001$
Organizational change	-.34	-.36	$p < .10$	$p < .20$
Satisfaction with pre-training phase				
determining target audience		.32		$p < .001$
determining learning needs		.39		$p < .001$
training design		.42		$p < .001$
Satisfaction with implementation phase				
technical equipment		.31		$p < .001$
role of trainers		.41		$p < .001$
length of program		.26		$p < .001$
Satisfaction with post-training phase				
evaluation		.36		$p < .001$
transfer		.37		$p < .001$
final report		.35		$p < .001$
Satisfaction with administration				
cancellation		.12		$p < .001$
billing		.24		$p < .05$
legal issues		.16		$p < .05$

Tests of Predicting Variables with TSI

The results of the different tests between TSI and the predicting variables are included in table 6. From the results, it can be seen that agreement reliability is very important for total satisfaction. So keeping promises, about for instance determining the audience of the training program, the role of the trainers, the way in which the learning needs will be determined, and the training design, seems to be a very important characteristic of training organizations. Although administrative issues are also significantly related to TSI, for 94-1 the r -values are less than .15, which is rather low. The same holds for the item 'length of program'.

Further analysis of the data of table 3.6 shows that the 'determination of objectives' is not significantly correlated with TSI. If objectives have been formulated, than it is important how specific they are. The degree of specificity is significantly correlated with TSI.

With regard to the importance of objectives, the results vary. It is striking that to the degree that learning results are more important for the outcome of the training, TSI is systematically higher, both for 93-2 and 94-1. This pattern, however, is not present for the importance of objectives for 'working behavior' and 'organizational change'. The correlations for these relations are less than .12.

Further, it can be noted that the degree to which the training organization is held responsible for fulfilling the objectives, is not significantly correlated with TSI.

Conclusion and Discussion

The preliminary conclusion of this study into the reliability of the CSR system for training organizations, is, all things considered, positive. The numbers of research units were somewhat limited. For this reason the results should be viewed with the necessary caution. Further research among larger groups of research units (non-respondents, re-raters, and second raters) should indicate whether the above conclusion is justified.

CSR for an association of training organizations is just one of the systems for quality control. Apart from advocates of ISO and the model of the European Foundation for Quality Management (in which CRS is an integrated part), there are advocates of market regulation in stead of implementing quality systems for marketing reasons. They contend for instance that reputation of training organizations can also be measured by the market share of the organization, its number of trainers and consultants, and its history. But examples are known of companies with large market shares of which the customers are very dissatisfied.

Table 3.6 Tests of Predicting variables with the criterion variable 'Total Satisfaction Indicator' ('TSI'), testing values and probabilities for both samples 93-2 (n = 312) and 94-1 (n = 501)

Predicting variables	Test	Value 93-2	Value 94-1	Probability 93-2	Probability 94-1
Objectives determined?	Mann Whitney	U = 2410.5	U = 7552.5	Not significant	Not significant
Specificity of objectives	Spearman correlation	.15		p < .05	
Specificity of objectives	Kruskal Wallis 1-Way Anova		Chi ² = 18.4		p < .001
Importance of objectives					
learning results	Spearman correlation	.22	.16	p < .001	p < .001
working behaviour	Spearman correlation	.10	.12	Not significant	p < .05
organisational change	Spearman correlation	-.07	.08	Not significant	Not significant
Responsibility of institute	Spearman correlation	.06		Not significant	
Responsibility of institute					
learning results	Spearman correlation		.10		Not significant
work behavior	Spearman correlation		.14		Not significant
organizational change	Spearman correlation		.18		Not significant
Agreement reliability in pre-training phase					
determining target audience	Spearman correlation	.28	.23	p < .001	p < .001
determining learning needs	Spearman correlation	.43	.30	p < .001	p < .001
training design	Spearman correlation	.48	.31	p < .001	p < .001
Agreement reliability in phase of education					
technical equipment	Spearman correlation	.32	.26	p < .001	p < .001
role of trainers	Spearman correlation	.41	.39	p < .001	p < .001
length of program	Spearman correlation	.20	.14	p < .001	p < .01
Agreement reliability in post-training phase					
evaluation	Spearman correlation	.19	.35	p < .05	p < .001
transfer	Spearman correlation	.24	.24	p < .05	p < .05
final report	Spearman correlation	.32	.37	p < .001	p < .001
Agreement reliability for administration					
cancellation	Spearman correlation	.26	.07	p < .01	Not significant
billing	Spearman correlation	.14	.09	p < .05	Not significant
legal issues	Spearman correlation	.23	.15	p < .05	p < .05

These organizations should have that information (and outside the training industry, big organizations do have that information), and act on that appropriately. Therefore, CSR should be seen as an addition to the existing approaches of quality control.

One of the issues in interpreting the final results of a CSR study for an association is the standard that expresses moderate, good and excellent performance. The mean TSI value for instance in both 93-2 and 94-1 was about 7.5, and the question is how to interpret this result. An association may choose a minimum level of customer satisfaction, which can be employed as a criterion for retaining membership. Applying such a standard for membership could be used when training organizations are repeatedly ranked below the minimum.

There are also organizations that conduct their own CSR. The internal value of this CSR is obvious. It can support quality improvement. But the marketing value of this approach is limited. Not many clients believe data on CSR that they produced themselves. In principle, the CSR system that is employed in this study, offers the possibility of making objective judgements about the quality of the professional services of training organizations. As such, it is an appreciated instrument for quality control. Clients of these training organizations know that independent CSR is being carried out. Many of the respondents were interested in receiving the ranking of the training organizations. They could use that information for their vendor-rating systems.

One of the limitations of CSR is the 'over-evaluation' of training projects. The training organizations evaluate in order to determine whether the clients are satisfied with their services. The client organization does the same, and, finally, an independent research institution conducts another evaluation. However, the frame of reference for the three evaluations is different, and therefore the research questions also differ to some degree. Still, it may be useful to determine whether a common database for the evaluations of training organizations, client organizations, and research institutions can be created. Such an initiative would be serious, because then the questions asked by the three parties would need to be at least partly standardized, and the same respondents would need to be used. It is particularly on this point of respondents that the three parties would show differences.

A second limitation of the CSR conducted in the way it was done in this project, is that the data is based on quality perceptions. The question is, to what degree the quality perception is a good indicator of the true quality. Within training, information about the true quality can be gathered from tests of learning results and reliable and valid indicators of improved working behavior and benefits for the organization. It is recommended to examine whether the SCR data in general and data on TSI in particular, significantly relate to more powerful indicators which can be used to determine the quality of the service of training organizations.

Many of the training organizations use the results for internal quality improvement. In the framework of quality improvement, it would be most useful for training organizations if all of the information from the customers was made available to them. The directors of the training organizations could then make links from the data to the trainers and consultants who conducted certain training programs. The data could then play a role in work meetings and assessments with trainers and consultants. Action could also be taken concerning customers who were less satisfied. From the perspective of managing individual training organizations, such a desire is understandable, however, from the perspective of independent CSR, there are problems. If this legitimate desire of the training organizations for more information were completely fulfilled, the anonymity of the research would have to be discarded. It is expected that the results of the research and particularly of willingness to participate, would be negatively influenced.

The use of CSR on the longer term leads to a form of benchmarking (Camp, 1989). Benchmarking can have an intra-, as well as interorganizational function. This implies both that the scores of one's own organizations through the years can be compared, and that the position of one's own organization can be compared with the average and with the distribution of results across other training organizations.

Cummings & Crull (1990) pointed at the importance of internal training professionals delivering excellent customer service. In their opinion training professionals have a lot to learn in this respect. Since 1990, little changed as to the importance of their message. The CSR system, originally developed for outside training providers, can also be used for quality improvement and internal marketing of the internal training department. If the internal training department is large enough, and it has various customers within the organization, the CSR system can be adopted easily. Conducting a CSR project within the organization will result in satisfaction profiles of branches of the organization by services provided by the training department. It can also be used for ranking the services, or units of the training departments, which, as in training companies, keep the trainers and consultants focused on the needs of their clients. If customer service leaves a lot to be desired, CSR can be a powerful tool to reorient the training department. High satisfaction ratings of internal customers will furthermore strongly justify the investments of the organization in the services provided by the training department. Also for internal use, it is recommended to outsource CSR. For internal CSR is not anonymous, and therefore less accepted than outside CSR.

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**Evaluation of an Electronic Performance Support System
for Instructional Design in Corporate Training Centers**

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This paper presents the evaluation of an electronic performance support system called the Quality Information Product Process-Performance Support System (QIPP-PSS) (Jury, Gustafson, & Reeves, 1993) developed for information product developers at AT&T Global Information Systems. Electronic performance support systems (EPSS) are a special type of computerized help system that integrate a knowledge base about a specific job, practical tools required for the job, and perhaps a decision support expert system (Carr, 1992, Gery, 1991). The general purpose of this field test was to assess the validity and effectiveness of the QIPP-PSS as an integrated performance support system for professional information product developers within AT&T Global Information Systems. The specific purpose of this evaluation was to examine to what degree the QIPP-PSS required revision before it was fully implemented across all sites. Methods used were questionnaires and interviews. Few major problems with the QIPP-PSS itself were revealed. The interface was not too difficult to learn and it allowed efficient use of the tools. The QIPP-PSS information base and tools as designed correlated with how people actually work at the participating sites. Minor problems were detected including the lack of sufficient explanation for certain processes. Participants also desired more samples with each tool. Improvements and additions to the QIPP-PSS have been undertaken. The primary issues to be resolved were local implementation ones, e.g., having local managers reinforce and reward systematic use of the instructional design process (QIPP) that the EPSS was designed to support.

Introduction

Electronic performance support systems (EPSS) are a special type of computerized help system that integrate a knowledge base about a specific job (e.g., instructional designer), practical tools required for the job, and perhaps artificial intelligence functions such as a decision support expert system (Carr, 1992, Gery, 1991). In recent years, there have been efforts to develop EPSSs for instructional designers, especially for designers who produce training for business, industry, government, and the military (Spector, Polson, & Muraida, 1993). These systems are intended to reduce the amount of redundant analysis that often occurs within a corporation's various documentation and training departments. In addition, EPSSs for training development should enhance the efficiency of instructional designers and increase their effectiveness in matching specific instructional dimensions to trainee needs and learning styles.

This paper presents the evaluation of an electronic performance support system called the Quality Information Product Process-Performance Support System (QIPP-PSS) (Jury, Gustafson, & Reeves, 1993) developed for information product developers at AT&T Global Information Solutions, a Fortune 500 corporation in the USA. The general purpose of this field test was to assess the validity and effectiveness of the QIPP-PSS as an integrated performance support system for professional information product developers within AT&T. Specifically, this evaluation examined the degree to which the QIPP-PSS required revision before it was fully implemented across all sites. As a formative evaluation, this study focused on the identification of specific features of the PSS that should be retained and those that needed to be revised or enhanced. All three major components of the PSS (interface, information base, and tools) were examined to determine their utility and effectiveness.

Evaluation Methods

Multi-method evaluation strategies were used as recommended by Mark and Shotland (1987), Flagg (1992), and Reeves (1993). Methods included questionnaires, observations, and interviews. Originally, we had planned to employ focus groups, and documentation analysis, but the QIPP PSS had not been implemented on a scale large enough to utilize these methods at the time of this study. Seven specific questions were addressed in this evaluation:

1. Does the QIPP-PSS work as designed? (What technical problems were corrected?)
2. Is the QIPP-PSS a valid support system for instructional design in training contexts at different AT&T sites? (The congruence between the PSS information base and tools and the instructional design procedures at the field sites was examined.)
3. How long does it take to learn to use the QIPP-PSS? (Training and documentation requirements for the PSS were assessed.)
4. How easy is the QIPP-PSS to use? (The efficiency of the user interface for accessing both the information base and tools was evaluated.)
5. What is the value and effectiveness of the tools in the QIPP-PSS? (The utility of the existing tools was evaluated and needs for modifications or additional tools identified.)
6. What is the value and effectiveness of the samples (examples) associated with the tools in the QIPP-PSS?

7. How is the QIPP-PSS used? (The frequency and duration of use of various components of the PSS by specific users were calculated.)

Data sources included:

- a. questionnaires sent to all participants,
- b. observations of QIPP training and discussion sessions, and
- c. face-to-face and telephone interviews.

The sample for this study included all AT&T sites that had installed the QIPP-PSS by November 15, 1993. Complete data was not collected from all sites, but a representative sample was obtained from six sites in the USA. The results are reported below in reference to the three major themes that emerged from the study: 1) The QIPP-PSS as a valid support system, 2) the value of individual components of the EPSS, and 3) training required to implement the QIPP-PSS.

Valid Support System

"The phases are very similar. We have analysis, design, we call it implementation [development], production and validation. But from there on, what goes on in those phases, for the most part, I'm redoing everything from that point on. Our process is streamlined compared to the corporate QIPP."

"I will have to modify it a bit. We are still using the old procedures. We are not running QIPP as it is in the PSS and we have a lot, quite a few templates that are not in there, or different versions (like the pagination sheet is quite different). What I am going to do is try and merge the two in the next couple of months, that is my main task [to add ours to the PSS] and anything I think we don't have a use for to strip out."

The extent of QIPP implementation in the target sites is critical to this evaluation of the PSS. We found that the use of QIPP varied on both a team and an individual basis. Team factors that govern the use of QIPP include the length of time the team has been in place, the type of information product (IP) developed, and the amount (or lack of) structure within the team or business unit. Factors on an individual basis include the length of time the employee has been in that position and previous experience as an IP developer, as well as the influence of the structure (or lack of) within the team.

Many teams are not using QIPP at all as their development process, or feel that it must be revised significantly for their site. For those that are not using QIPP as their process, they feel it either does not apply to their business unit, or feel that their existing process is effective and efficient. Those teams satisfied with their own process have typically been established as a unit for some time (usually years) and their members have typically been working in the same position for a substantial time. In addition, these groups were small, and felt communication between members was good enough to facilitate updates on forms, procedures and job aids.

Teams that have employed QIPP but feel it must be altered for their site generally felt that the corporate version of QIPP was too complex, and wanted to "strip down" the PSS for use at their site. In addition, some teams are using QIPP (and PSS) as a parallel or secondary process for now, waiting to see how it will merge with the current system.

Only one team respondent felt that he would be implementing QIPP quite thoroughly in the near future. The reasons given for using QIPP were new personnel, need for process documentation, and a lack of current process structure. Individuals who are new to a position tend to see QIPP favorably. Those new to IP development as well as those in new positions see it as the key to their process. However, they express some doubt that other employees are following the process "by the book." The PSS also tends to be seen favorably by employees new to a position or to IP development.

One of the primary conditions needed to facilitate the adoption of technology innovations is dissatisfaction with the status quo. The dissatisfaction can come from supervisors, but for the innovation to succeed the user must feel a need to adopt the system. If users feel the system is an encumbrance, they may even sabotage or in other ways inhibit its implementation. Having something relevant is also a highly motivating factor. If the corporate version of the QIPP process is seen as unnecessarily time consuming, then it will fail to be adopted and the PSS will also not be adopted.

Although respondents were generally in favor of the PSS, and gave tacit agreement to the QIPP process, some felt that their particular process did not need revision. Hence they will be unlikely to adopt the PSS, even though they may make an effort to try it out. Many sites have already validated their process for ISO 9000 certification. It will be very difficult for these sites to restructure their processes now that all of their documentation is in place. For these sites, QIPP and the PSS may serve only as an adjunct for the near future.

"I found it to be very helpful. I am new to this field, and consider myself a novice. I found it organized very well. I did not go in to analyze the content so much because I don't think I have the expertise to do that, but what I did do is analyze "Could I use this?" I think it would be useful particularly for people who are new."

"At this point, to answer honestly, I can not really say that I see that it is going to be a great big help. We have our process documented. We have all the job aids and tools that we are using available, that people can bring right up and use them, all logically filed away on our server. At this point, until I learn more about this support system and play with it, let's say I'm on the skeptical side yet. It has the possibility of being an encumbrance, an additional overhead."

Opinions on the value of the PSS range from the feeling that it is an additional encumbrance to seeing it as a complete support system. Many wished to reserve judgment on the PSS's potential benefit until it had been modified for use in their site and implemented fully in project development. Most of those who wished to modify the PSS saw this as an important agenda for 1995. Specific ideas about how they might use the PSS range widely, and include seeing it as an electronic documentation system, a job catalog, and a checklist system.

Findings indicate that there is strong interest in expanding the PSS to other areas. Engineering is the predominant area, both with interest from the engineering side and expansion of the PSS to include the engineering process so that IP developers would have greater communication with engineers and deadlines could be more easily met. The idea is that if the engineers knew the IP process, and IP developers understood engineering, that both would work more efficiently. This was mentioned in light of the adoption of the Product Realization Process currently in use in some sites. (The Product Realization Process uses cross functional teams and checkpoints to facilitate coordinated development efforts.)

AT&T GIS employees on the whole are very open to new ideas and innovations. Everyone surveyed felt that the concept of a PSS had great promise, and that the idea should continue to be refined, expanded and developed for a number of other areas. The feeling was expressed that communication between departments (engineering, sales) and IP developers would improve if an overall PSS was developed to include all members of the process.

The positive response given to the idea of a PSS shows that AT&T GIS employees want to try to do their jobs more effectively and efficiently. The PSS can provide varied levels of value. For the new employee it can be an orientation to the process as well as invaluable help in providing examples, templates and guidance in the process. For a seasoned employee it can provide new ideas as well as a structure for process documentation and management. For those employees with an already established process, it remains to be seen if the PSS can be adapted to the process, or if it will be seen more as a "tool catalog."

The Value of Individual Components

"It was not intuitive...confusing."

"I think overall it is a good tool. There are many good points to it. It does help you follow your process, keep your head together with records of what you've done, where you're going."

Respondents felt that the overall design of the PSS made for ease of use, but often felt confused about details. Some of the perception about ease of use may be a result of early problems encountered in installing and setting up the PSS on their individual machines. After version 2.3, installation bugs were minimal.

One of the underlying tenets of the deployment of the PSS (and QIPP) is to facilitate the adoption of instructional design principles in IP development. In this regard all users readily accepted the main screen interface as easy to understand. In essence, most felt that it does communicate the process clearly, and facilitates following the process.

There is a trend throughout this evaluation that novices (to IP development, computers, AT&T GIS) are more favorable and enthusiastic than seasoned veterans. In particular, one respondent who was new to the company, IP development, and Windows, remarked that they found it easy to get around, and that the buttons provided information on what was needed to be done. She said, "I understood what you were trying to tell me...the key thing is that when I got to a place where I wasn't sure what this was, there is all this help stuff." It is encouraging that this novice found the interface easy to understand. However, PC experience is still a prerequisite for successful operation of the PSS due to the complexity of the various applications involved.

In contrast to the novices, many users who have a number of years in their present position or as IP developers were more critical of details in the interface. Icons, placement of menus, terminology, and functionality seemed to take precedence in their discussion. The eager novices and the critical experienced personnel divide the interviewees into two camps. Those users familiar with computer applications and able to function at a high degree of complexity seem to get caught up in details that they may find irritating and lose the general idea of the product. Even so, attention must be paid to those "irritant elements" and, in this case, eliminate them to the degree possible during the alpha and beta stages of development.

Few mentioned the customization properties of the interface, and it seems that the lack of time spent on the system contributes to their lack of knowledge. We found that users spent time on the system mostly as a result of the evaluation. The novices have as yet not had time to fully implement the system on a project, and the experts are generally content with the status quo.

"Having something in front of you is much better than reinventing the wheel."

"I can't answer that because I haven't gotten that far along."

"It's not easy getting and finding the information."

Perhaps the most significant aspect of the data concerning tools and examples is that there was little comment about them. Interviewees generally had no real opinion about the tools, and when pressed, it appears that they had not as of yet investigated them to any extent. Actual use in a project was minimal. Some commented about the excessive number of tools, feeling that they would only use a small portion of them in their actual work. Of the few mentioned, the audience descriptions and checklists were the most favored.

The concept of tools was generally well received. Most felt that there was a great deal to be gained from not "reinventing the wheel every time." One of the most common questions related to the number of "blank Word files". Participants were not sure what they were, if they had a function, and why they were in the PSS.

The examples were, for all practical purposes, not accessed. However, positive feedback was given to the idea of providing them in the future when more of a user base is installed. Most respondents felt that the on-line information base (help for QIPP) was not valuable for learning the QIPP system. They found the system hard to manage, often citing navigation confusion. However, those new to the QIPP process (who had not had the training class) found the on-line information base more helpful.

Having something relevant to their work is highly motivating. Many users could not find some of the tools appropriate for their site, especially if an existing process was in place using different applications than MS Word or Excel. In theory, customization can take place but some users have already lost the impetus when told that a significant renovation must take place before productivity occurs. However, at least three sites are currently customizing the PSS for use at their site, and will be distributing the modified PSS. At one site, where the team is being restructured, QIPP and the PSS will be implemented fully in 1995. Valuable data should result from this model implementation. Regrettably, at the time of this evaluation, the examples fall prey to a lack of data even to a greater extent because of the fact that no significant project work has been completed.

Relevance is clearly a determining factor in the use and value associated with the information base. Those who have been through the QIPP orientation saw little use for an on-line copy of their notebooks. However, users who were new to the system or had not participated in the orientation felt it was useful to have it in the system.

Training

"I liked the exercises. We looked at the PSS later in the day, and were feeling a little silly by then. The class could have been shorter, could have been one day. If it is two days, I would like to see it be more hands on, not the lecturer going on and on. We never got to usability, only to development. I liked the group, we did a simulation of audience descriptions. Everyone could throw something in, what others hadn't thought of."

"And really we spent very little time on the software part of it. It would have been better if the workshop was designed around the software. A brief overview, a short brainstorming session, and then go straight to the software. Then when you come back, you can load it on your PC, and you would start to use it a lot quicker. Also perhaps more instruction by video on what this [PSS] can do."

Of those interviewed, we found that the PSS is currently being learned in three ways: ad hoc, the QIPP training class, and the PSS support group meeting held in Dayton. Those who received the PSS but were not given any training on it reported little, if any, use. Those interviewed who had participated in a QIPP training class had varying exposure to the PSS, but all felt that the time devoted to the PSS should be greatly increased. All felt that the little time that they were able to do something hands on was the most productive and rewarding in the session. Hands on activities included group discussion and the use of the PSS. All expressed a desire for less lecture, particularly the detailing of each step in the QIPP process.

Participants in the PSS support meeting also had a consensus of views. They felt like they should have been provided with an overview of the concept and features of the PSS before getting into all the details about installation, file structure, and customization.

When asked what they learned at the QIPP training class, most users remembered the small group practice exercise and the demonstration of the PSS (when it was given). Learners learn by doing, and the classes were recalled as being mostly a slow paced lecture on each phase of the QIPP process. This training must be made more relevant and experiential to facilitate acceptance of the QIPP process as well as the PSS technology.

At the PSS support group meeting, the concept of the PSS was not understood from the outset. Some users at the PSS support group meeting reported being distracted by the complexity of loading files and getting the PSS running. A presentation of the concept and examples using the PSS were suggested for the outset of the meeting.

"Most of us going into it did not know what a PSS was. A little more time giving a structure of what it is and how to's. After coming back home and being able to see what is going on myself I saw how simple it really is."

"[Need] some educational materials, maybe a videotape, with a demo that really showed the value of it and what you can use a PSS for."

Many of those interviewed expressed a significant lag in the time between being exposed to the PSS and realizing its overall purpose and value. Of those who felt this way, many felt that they were caught up in the details of installation, setup, exploring job aids, dealing with the interface, and so on. It was only after some time that they realized the "big picture." A request was often made for a video of the PSS, giving an introduction and some of the things that can be done with it. In addition, many felt that the QIPP class should include a great deal of hands on use of the PSS.

Although the purest form of PSS would require no training associated with it, we feel that some initiation to QIPP and the PSS must continue. However, it is imperative that this training focus initially and primarily on the attributes and benefits of such a process/system. People need to know why this is going to make their job better or more efficient. Participants mentioned that in both the QIPP class and the PSS training the idea of the big picture came slowly. If the idea of QIPP is not adopted, users will not be in a position to understand the big picture for the PSS.

A familiar theme throughout the evaluation is that users frequently were caught up in the details of interface, installation, bugs, etc., and failed to fully understand the concept behind the PSS. This lack of seeing the purpose and potential of the PSS will seriously inhibit use. If users understand that the PSS can benefit them in time, effort, or a better product, they will adopt it.

"If I had a week, and I could just sit down and look at all the parts [of the PSS], determining what I could use every day, and what I don't need, I could make this a useful tool. We have been just so busy getting work out, been out of town quite a bit. Going to need time to do this. There is just no way that you can remember everything from the workshop."

One of the prerequisites to an evaluation of a new technology is that people are using it. Unfortunately, this was a hurdle in this study. All of those interviewed said that they either had little or no time on the system or that they wished that they had more time. Some felt sheepish about their lack of time invested, and some, when called, asked for some more time to learn it before going through the interview. The most prevalent reason for not learning to use the PSS is time commitments to ongoing projects.

Comments on the time required to learn the initial system ranged greatly, but most agreed that it would take a few hours to learn to navigate the system. However, there was a consensus that previous to placing the PSS in the final user's hands, it should be customized for the site. The time required to do this was seen as quite extensive, ranging from days to weeks, with some recipients targeting this as a significant project in early 1995.

We felt that for some users their comments reveal that they still do not see the PSS as a time saving device, or they would invest the time. For others, although they may see it as a potential time saving device, there is still the problem of immediate workload, and the process in place is getting the job done.

Successful implementation of an innovative technology is dependent on the availability of time to learn, adapt, integrate and reflect. This time must also be "good" time: company time, paid time. Without the PSS support group meeting held last Fall, the PSS had little chance of success. However, support must continue. Leadership must find the time for the process to continue to be integrated. Two kinds of time are necessary: time to learn the system, and time to adapt the system to existing processes. The second is just as crucial as the first because of the need for the process to be relevant to the local site.

Recommendations

- QIPP training should emphasize the customization of the process, with a small group activity where participants can discuss their particular site needs.
- A study should be conducted to evaluate more fully the extent to which QIPP and similar processes are being carried out in the field.
- The developers of the PSS should explore how it can be used by different types of users who have different levels of skill and expertise.
- A study should be conducted of how IP development units that already possess ISO 9000 certification can incorporate selected elements of the PSS into their process.
- Information about the PSS should be widely distributed within AT&T so that other units may assess the degree to which it (or some variation) might be useful to them.
- As future versions of the PSS are developed, frequent formative evaluation with end users should be conducted to help eliminate confusing elements in the interface. Usability testing at one of AT&T's usability labs is recommended.
- The PSS should be given primary attention in subsequent QIPP orientation sessions, helping to merge the idea of the ID process and the supportive nature of the PSS.

- The question of how to promote local adaptation of the PSS should continue to be examined.
- Careful follow up work should be conducted on any site that is implementing QIPP and the PSS more fully as their process in 1995. Results can yield additional data on the use of tools, examples, and the information base.
- Follow up work should be conducted on those sites that are customizing the PSS for their process, to identify which specific tools are being kept, added or modified.
- An on-line user group (usenet, listserv) should be established to promote discussion and promotion of examples.
- Increased time for training is necessary.
- Time must be allocated "on-the-job" for IP developers to learn to use the PSS within the context of their actual work.
- Management must recognize that adoption of new processes takes time and requires their continuous support.
- A full integration of the PSS should be included in the QIPP training class.
- More hands on and group work should be implemented in the QIPP training class. There should be less lecture in the class, and the detailed explanation of each QIPP step should be eliminated as each of these steps may not be relevant to every site.
- A live or recorded demonstration of the value and concept of QIPP and PSS should be delivered, including practical illustrations of what can be done with the PSS in an IP work environment. A video should be produced about the concept, attributes and benefits of EPSS.
- The PSS training should focus on the overall purpose and function of PSS's and how people already use some forms of them in both their professional and personal lives.

Summary

The formative evaluation was intended to identify problems and deficiencies of the PSS. Few major problems with the QIPP-PSS itself were revealed. The interface was not too difficult to learn and it allowed efficient use of the tools. Minor problems were detected including the lack of sufficient explanation for certain processes and a few "bugs" in the underlying code for the shell. Participants also desired more samples with each tool. Improvements and additions to the QIPP-PSS have been undertaken. However, the QIPP-PSS

information base and tools as designed do not correspond well with how people are actually working at the participating sites. The primary issues to be resolved were local implementation issues, e.g., recognition for and support by local managers of workers who actually use QIPP, the instructional design process that the EPSS was produced to support. As Stevens and Stevens (1994) emphasize, there is not much value to be found in an EPSS that supports a process few people use. Time and rewards for learning and using QIPP and the PSS are major requirements.

Implications

Instructional designers often fall back on the same type of training program they have used in the past without seriously considering alternatives because they already have most of the pieces for such a program and simply need to rearrange or update them for a given context. While this may be satisfactory in some situations, the overall dismal record of training effectiveness (Cohen, 1991) indicates that alternative approaches should be considered. EPSSs such as the QIPP-PSS encourage designers to consider alternatives, assist them in matching different training approaches with different contexts, and provide them with prototypes and templates that can be tailored for specific training needs. Of equal importance is the need to improve the efficiency of instructional designers. Redundancy of analysis effort has plagued many corporations when training developers, documentation authors, and others all carry out virtually the same job and task analyses for new products. This study supports the potential of reducing expensive duplication of effort through the utilization of a comprehensive EPSS for information product developers. It has also revealed important issues regarding local implementation of such a system that can provide guidance for other companies considering the development or adoption of EPSSs.

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**Toward Meaningful Evaluation of Manager Training in
Technology-Based Companies**

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Introduction

Training is an organizational imperative. It will require evaluation that will drive training to new levels of added value and to greater contributions toward business performance and competitive advantage (Brinkerhoff, 1986, p. 11).

In a world of intense international competition, where customers are sophisticated and demanding and technologies are diverse and dramatic in their effects, those who stand still in product and process development will neither prosper nor survive (Clark & Wheelwright, 1993). Competitive advantage accrues to firms that bring to market in a timely and efficient manner products that meet customer needs (Clark & Fujimoto, 1991). One of the primary barriers to achieving such advantage, however, is inappropriate or outdated management attitudes, capabilities, and strategies in directing product development teams (Hayes, Wheelwright & Clark, 1988; Senge, 1990).

While it seems likely that improved management skills hold the potential to enhance the attainment of organizational objectives, management training has typically been a low priority (Lambert, 1985). For this situation to change, organizations and their managers must come to see such training as adding value directly or as having the potential to create future value for the organization. Training must be positioned as a business partner able to contribute directly and significantly to the total performance of the organization. Management training programs that reflect an innovative mindset about manufacturing and technology, that provide strategies for integrating the development process, and that deal with creative problem solving and the generation and testing of new ideas are urgently needed (Gist, Bavetta & Stevens, 1990). Managers want and need training programs that will enable them to assimilate knowledge from the environment, generate knowledge within the company, foster the development of their own skilled workers, and generally help them to cope with the fast pace of today's corporate life.

Integral to the development and implementation of such training programs is effective, user friendly evaluation that is applicable across a wide variety of training situations (Brandenburg, 1989). Unfortunately, the evaluation of training has, to date, been limited by the use of inappropriate indicators. For example, training effectiveness is often measured via informal evaluations such as end-of-the-day debriefs and short surveys administered directly after training occurs. Furthermore, the trainee has traditionally been viewed as the customer of training, and the evaluation process has reflected this emphasis. Consequently, little attention has been paid to assessing either the transfer of training or training's benefits to the organization. Where such attempts have been made, researchers have often tried to establish links between training and such factors as profits, sales, or return on investment

(Shelton & Alliger, 1993). These links, however, are difficult if not impossible to demonstrate, because the value of training is a function of many non-training factors, including compensation, job design and reward structures. These difficulties suggest that current instruments, strategies, and procedures are inadequate, failing as they do to accurately or fully capture the benefits of training to the organization. The present study, therefore, seeks to develop a conceptual framework that could support the valid evaluation of managerial training impact on technology-based organizations.

Conceptual Framework

Training has not traditionally been considered critical to an organization's operations. Upper management generally tolerates training and views it as a staff benefit or as a means to remedy a skill deficit for particular employees. This situation is unlikely to change unless those responsible for the development, implementation, and evaluation of training develop strategies and programs that will help managers and others see the value of training and consider it as an investment in the future of the organization. The determination of how to get managers to view training as a tool for achieving the strategic goals of the organization must therefore be addressed.

In today's climate of diminishing resources and increasing accountability, it is necessary to assess and validate the efficacy of training and make necessary improvements. As both the demand for and the cost of training have increased, the need for informative, cost-effective evaluation has also increased. The challenge for evaluators is to establish training as a valued, productive business partner that makes effective contributions to competitive advantage in a global market (Brinkerhoff, 1989). There is today an opportunity for evaluation to become a vital catalyst in the transformation of training. Organizations need new methods of evaluation that are supportive of training and training that is supportive of business goals.

Training Evaluation Strategies

The purpose of evaluation should be to ensure that training makes the most effective and efficient contribution possible to organizational goals. Systematic methods of inquiry can be used to identify organizational goals and produce information that supports rational decisions about training needs. Once these needs have been identified and training is under way, continuing to meet organizational goals requires that evaluation be ongoing and that training information and results be disseminated throughout the organization.

Many years ago Kirkpatrick (1959) developed what is now considered the classic four-step approach to the evaluation of training which focussed on reaction (did participants like it?), knowledge (did participants learn?), behavior (did participants use what they learned?) and results (did the organization benefit?). Brinkerhoff (1987) developed a six stage model of human resources development evaluation that placed more emphasis on informing systematically organizational training needs. Brinkerhoff's model also includes examination of the utilization by training participants of skills, knowledge and attitudes on the job and benefits to the organization. These models remain popular because of their comprehensiveness, simplicity and applicability to a wide range of training activities (Brandenburg, 1989). But quite apart from the focus of models on training transfer issues most evaluations of training still determine only if participants liked the materials, format, and facilitators and whether they learned the concepts and skills taught in the program (Shelton & Alliger, 1993; Tesoro, 1993).

Evaluations of training often reflect confusion about who the training client is. Too many training professionals have become preoccupied with customer satisfaction, with the customer mistakenly viewed as the trainee. The customer is, in fact, upper management of the organization that pays for the training (Brinkerhoff, 1986, 1989). Not only do current evaluation practices focus largely on the individual trainee as the primary unit of analysis, but evaluation is often restricted to events occurring within the immediate training environment. But "unreinforced learning fades rapidly, raising the question of whether the amount of effort and money spent on training are justified" (Kruger & May 1985, p. 70). Successful training involves both the acquisition and the maintenance of behavior (Michalak, 1981). This suggests that evaluation must assess both the acquisition of training content and its transfer to the work environment. If the real purpose of evaluation is to meet organizational goals, information must be gathered from project managers and senior management to determine whether training has in fact changed organization members' skills, practices, and attitudes.

Measurement Approaches

If we concede that it is necessary to examine the impact of training on the organization since the organization is the true customer of training, impact needs to be validly operationalized. Many evaluators (e.g., Kayloe, 1977; Kearsley, 1983; Milatzo, 1989) have attempted to do this using traditional econometric indicators, a practice that has fallen short of success for at least two reasons. First, unlike most fixed or variable costs, training costs are difficult to estimate since both costs specific to the training program itself and those linked to lost productivity due to people being taken away from their jobs must be taken into account. Second, traditional economic metrics, while being time honoured indicators of organizational

performance, are relatively far removed from and insensitive to the detection of the intended benefits of training. A large part of the problem is that purely quantitative models tend to be based on unchecked assumptions that may be less than trustworthy. Therefore, while the usual questions — Are we getting our money's worth? What is our return on investment of training dollars? — are inherently appealing, they do not help to operationalize organizational impact.

Other researchers recognizing the limitations of strictly quantitative approaches have attempted to integrate quantitative and qualitative methods. Brinkerhoff (1992), for example, proposed the Program Quality Index which builds on his six-stage model and on the operationalization of each of Kirkpatrick's (1959) four levels as numerical values. Similarly, Michalski (1994) developed the Training Effectiveness Index, a composite function of selected effectiveness variable components or weighted values known to be correlated with outcomes sought by customers. Michalski's model allows for the weighting of variables that might be of importance to specific organization customers that are beyond Kirkpatrick's framework. Examples are proportion of target group trained and expectation fulfilment. These methods are advantageous to the extent that they provide readily automated, transportable and customer responsive data that could be useful for organization decision making. But as noted by Michalski (1995, p.8) "a careful examination of many quantitative methods inevitably leads to many questions about assumptions, application feasibility and the validity of results."

While conventional assumptions and methods have restricted the usefulness of data to help answer complex organizational questions, some evaluators have looked to qualitative methods for the evaluation of training (Jacobs, 1985). Typically, with these methods validity is enhanced and training impact data are likely to help managers accurately portray training's worth to the organization. Similarly, on-site interviews and observations gathered after a training program have the potential to provide richer descriptions and understanding of transfer of training. In an evaluation conducted in an international business setting, Jinkerson, Cummings, Neisendorf and Schwandt (1992) emphasized the benefits of collecting and analyzing qualitative data. Arguing that qualitative data adds depth to both analysis and evaluation, they discuss a combination of three approaches — document review, personal interviews, and survey — to address project objectives in a relatively cost-effective manner. Qualitative data collection, however, was necessarily structured in order avoid generating a huge amounts of data only some of which would be relevant to the evaluation objectives. While qualitative approaches to assessing training's impact may be more sensitive to the sorts of organizational impact one might expect from training, their relatively high costs in terms of time and labor-intensity are prohibitive.

In summary, strictly quantitative measures to organizational impact of training are limited to the extent that they may be based on faulty assumptions and relatively insensitive to the detection of training effects. Strictly qualitative approaches, which, being

eminently more sensitive to the detection of influences are unfavorably costly and labor-intensive. Furthermore, it seems necessary in the evaluation to impose structure in advance of qualitative data collection in order to avoid being overwhelmed with only peripherally useful information. Methodologically eclectic approaches that combine qualitative and quantitative methods of data collection and compilation show promise from the point of view of maximizing feasibility, accuracy and, ultimately, utility. Regardless of methods used, it is necessary to develop our conceptual understanding of organizational impact such that the collection, analysis and interpretation of transfer of training data can improved. We now briefly examine organizational learning as a theoretical perspective that holds great promise for informing our evaluation decision making.

Organizational Learning Framework

The organizational learning literature is burgeoning. Although a systematic review of this literature is beyond the scope of the present paper it is necessary to review key conceptual issues and constructs for our present purposes. Fundamental to conceptions of organizational learning is the development among organization members of shared mental representations or understandings of the organization and how it operates. Some theorists take the view that such learning need not be directly observable through changes in organization members' behaviors. What is important is that the range of potential behaviors is changed (Huber, 1991). Others, however, insist that it is through behaving and experiencing that we learn and that organizational learning is not possible unless a process that allows for error detection and correction is operative (Argyris, 1993; Argyris & Schön, 1977). Most theorists agree that organizations experience different levels of learning ranging from low-level, first-order or single-loop learning, where change is incremental, to high-level, second-order, or double-loop learning where fundamental assumptions about the organization and its operation are surfaced, questioned and ultimately altered (Huber, 1991; Fiol & Lyles, 1985; Lant & Mezias, 1992; Lundberg, 1989). Additionally a form of meta-learning labelled by Argyris and Schön (1978) "duetero learning" has been identified but not well developed. Ostensibly organizations can learn how to improve their capacity to learn. A final distinction that has prominence in the literature is Daft and Huber's (1987) differentiation of system-structural versus interpretive organizational learning systems. They suggest that organizations may oscillate between the two depending on circumstances, requirements and needs. System structural learning systems assume that a given organization exists in an objective environment, that understanding leads to action and that the rational analysis of data is how that understanding is to be achieved. On the other hand, interpretive systems assume that the organizational system gives meaning to data which are inherently equivocal and that learning

is a consequence of dialogue and the development of shared interpretations among organization members. The two systems are not thought to be incompatible or mutually exclusive.

Training provides one approach to the enhancement of organizational learning. Organization members who engage in training activities can acquire information external to the organization that can be shared and consolidated through dialogue and sharing with other members both during and after the training event. Training activities that are longitudinal and build in opportunities for participants to apply knowledge and skills and to interact with other members of their home organization are likely to be more potent in this regard. It is therefore sensible to think about the impact of training within an organizational learning framework. The problem then becomes one of operationalizing organizational learning. Huber's (1991) perspective that learning is defined by change in the range of potential behaviors, although conceptually appealing, is limiting to the extent that it does not suggest how one would measure such change. If one were to adopt, on the other hand, the perspective that learning cannot occur unless it is through behaving and experiencing (Argyris, 1993) there are very direct implications for the measurement of learning; that is, change in behavior of organization members is key. Such a perspective is adapted in the present study. Doing so means that one is now faced with the problem of identifying the important and relevant dimensions of behavior on which to focus. Before considering an approach to addressing this problem, a particular caveat needs to be introduced.

While organizational learning provides a suitable framework for conceptualizing the impact of training, it falls short of dealing adequately with the problem of unit of analysis. Clark and Fujimoto (1991) and Clark and Wheelwright (1993) identify the product development project (PDP) as the appropriate unit of analysis for thinking about organizational learning in technology-based companies. PDP units within organizations operate as distinct entities and provide a realistic basis for organizational learning to occur. Using PDPs as the unit of analysis also alleviates problems associated with organizational size and functional complexity. Clark and Fujimoto (1991) argue that the search for learning effects in the larger firm would be obscured by structural considerations; expectations for the generalizability of effects on any given subunit to the larger firm would be contingent upon a plethora of factors and conditions several of which would be unrelated to the innovation in question. While this posture represents a departure from most organizational learning theorists it seems plausible in view of the integral nature of social interactionism to the organizational learning process. By its very nature the PDP provides a basis for social processing and the development through dialogue and deliberation of a shared representation of cause-and-effect relationships and processes.

Focus for the Present Study

The present study is to be the first in a series of studies designed to develop and empirically validate instruments, procedures and strategies for the evaluation of management training in technology-based companies. Such companies typically have different management training needs than more traditional firms in the manufacturing sector. While PDP team members are generally highly skilled in technologically specialized areas such as systems design, software and hardware engineering they typically do not have much in the way of management training. The specific focus for this study is to develop a conceptual framework that would identify and explicate empirically the dimensions of organization member management behavior that are relevant to PDP successful performance. Such a framework would then serve as guide to the development of instruments and strategies for the evaluation of management training. The development of such instruments is beyond the scope of the present study.

Method

Overview

The research reported here is the result of a collaborative process involving members of the research community (universities) working in partnership with members of the community of practice (technology-based companies). The project differs from traditional stakeholder-based strategies for evaluation since (1) project control is shared between researchers and practitioners, (2) only a small number of primary users (stakeholders) are involved in the project and (3) practitioners participate in a wide breadth of evaluation activities including data collection, analysis and interpretation. This is approach, which is designed to maximize the utility of evaluation data, has been labelled participatory evaluation (Cousins & Earl, 1992, in press).

The research team consisted of seven members: four university professors and three individuals responsible for the development and implementation of management training programs in an Ottawa technology-based company. One of the academic team members is in engineering and technology management, one in business administration and the remaining two are in education.

Concept mapping was used as a tool for developing the conceptual framework. Concept mapping is a procedure for identifying program structures, defining problems, understanding stakeholders' perceptions and evaluation needs, and exploring alternative strategies and organizational arrangements. The Concept System, a multi-dimensional scaling software package developed by Trochim (1985), permits the mathematical calculation and graphic representation of problem/program concepts (clusters) and their relational properties. Although there are many possible applications of concept mapping (Trochim, 1989; Trochim & Linton, 1986), the general approach has selected stakeholders asked to generate words, phrases, or sentences that have relevance to their program (its goals, problems, processes, and satisfaction). Once these descriptors are identified, a sorting procedure is implemented. Evaluators then use multidimensional scaling and cluster analysis to analyze the results of the sorting procedure and produce a concept map that represents the locations and groupings of the original descriptors. Stakeholders also provide importance ratings for each of the items thereby permitting the evaluation of the relative importance of either items or clusters (concepts). To follow is the specific application of concept mapping procedures adapted for the present study.

Sample

Ten managers from nine technology-based companies were invited to participate in the study. Organizations selected for participation were technology-based companies located in Ontario, Canada, that depend on the development of new software and hardware products for competitive advantage. Most of these companies were located in eastern Ontario, a Canadian region known for technological innovation and production. We selected managers for the study who were reputationally successful as directors and managers of PDP's. This determination was based on the knowledge brought to the project by the practitioner members of our collaborative team. While some of these managers were themselves engaged in or exploring management training opportunities, by and large they were sending staff to management training events.

The ten managers were approached and asked to volunteer to participate in a study designed as a first step toward improving the evaluation of management training. They were informed that their involvement would be limited to a one hour taped interview and, subsequently, a sorting and rating task of about the same duration. Data were collected on an individual basis; the participants had no knowledge of who or how many other participants were in the study.

Data Collection: Instruments and Procedures

Interview data were collected by six different research team members, each conducting one or two interviews. The interviews were private, held on-site and were tape recorded with the participant's permission. Each lasted about one hour. A structured interview guide was developed for data collection (see Appendix). The interview guide began with a variety of questions relating to the products and services of the company and the particular role in the company played by the respondent. One of the questions asked respondents to locate the proportion of the company's PDP's that would fall into each of four cells defined by the classic 2 X 2 risk matrix with axes representing development risk (new technology, standard technology) and market risk (low, high). Following direct questions about how the company defines project success, behavior description interview techniques (Janz, Hellervik & Gilmore, 1986) were used to obtain detailed information about two specific "successful" PDP's of the participant's choice. These projects were discussed in sequence. For each, questions about professional staff involvement, the importance of the project to the firm, the nature of project success, and factors contributing to it were covered. Finally, the instrument addressed some background information including the respondent's experience with the company and the company's needs concerning management training and their general approach to meeting such needs.

Once interview data had been collected, researchers independently extracted, by reviewing notes and/or relistening to tapes, information that would be useful in describing successful PDP's. The collaborative research team then met for a half-day session to develop a list of short phrases and sentences through a brainstorming activity grounded in the interview data. At the end of the session, a revised list of 47 items relating to PDP success was produced. These items were then entered into the Concept Systems program and sets of 3 x 5 inch sorting cards (shuffled) and one-page rating forms were produced and sent by overnight courier to the manager participants. Particulars associated with the card sort and rating tasks are described below. These procedures follow closely those described by (Trochim, 1989).

Card Sort Task: Each participant was asked to read the statement on each of the 47 cards, then sort the cards into piles in a way that made sense to him or her, placing similar statements in the same pile and grouping for similarity, not priority. Participants were advised that there were no right or wrong groupings and that they could make as many piles as they wanted; they could not, however, create only 1 pile or 47 piles. Statements unrelated to others could be placed in their own pile. Participants were then asked to secure each pile with a staple, paper clip, or elastic band. Optionally they could write names for the piles on the backs of the top cards.

- **Importance Rating Task:** Participants were asked to rate each of the 47 statements on the rating sheet provided in terms of its importance for PDP success. The following instructions were given to each participant: "Rate the statements in accordance with its importance for project success. Rate each statement on a scale from 1 to 5 (where 1 = Relatively unimportant and 5 = Extremely important) by writing the number on the blank line in front of each statement on the rating sheet. We encourage you to spread your ratings out; use all five rating values at least once."

Participants were then asked to return their responses by overnight courier. Most respondents returned their responses within the prescribed one week timeframe, although one manager had to delay his response due to an unanticipated business trip. He subsequently provided the response, but these data were not available in time for the next phase of the process.

After having accumulated the sets of rating and sorting data, these were then entered into the program and preparations were made for another one-half day meeting of the research team. The purpose for the session was to interpret the observed results. The team first reviewed on screen (using a PC viewer and overhead projector), the default cluster solution and its associated importance ratings and bridging indices (described below). Through extended dialogue and deliberation, the default solution was modified using features of the program until a cluster solution that met consensus agreement was produced. The conceptual framework was then constructed on the basis of this final solution. These data are reported below.

Results

Interview Data

A wide range of products and services in hardware, software and service solutions were covered by the participating companies. Respondents ranged from one to large numbers of PDP teams for which they had responsibility, although in some cases, individuals' responsibilities were not directly tied to new product development. Considerable variation was observed on the extent to which new PDP's were internally driven or responses to specific external requests or demands. Some reported up to 80% of their projects were internally

driven while for others it was as low as 5%. Most PDP's were located by respondents in the high development risk / low market risk quadrant, although projects with both low development and market risk were common. Relatively few participants located projects in the high development / high market risk cell and there were no projects assigned to the remaining cell, high market risk / standard technology.

Variability was also observed in how success was defined relative to PDP's. Some managers suggested that market performance was a key criterion if not the sole yardstick, but most respondents minimized this indicator in favor of other product related features such as success in mastering the technology within a defined time period and product performance, reliability and durability. Several offered the view that a splash in the market is much more of an exception than a rule in the industry, but that other pay-offs in terms of technological developments and their generalizability to alternative applications are much more useful indicators of success.

With each respondent reporting on two PDP's it is not surprising that quite a wide range of projects was selected for more detailed analysis. The majority of these were located in the high development risk / low market risk quadrant, as described by respondents. Almost invariably, respondents were directly involved in the projects, if not as director as team member, and generally, the projects selected were thought to be important to the firm in some way. These data were the most lucrative for the purpose of developing the conceptual framework, and so further discussion of them is deferred to the section to follow. Finally, respondents revealed in response to the final questions in the interview that they had a variety of experiences in the industry, some having served for a number of different companies while others remained within a single firm. They were relatively unanimous in their dissatisfaction with management training opportunities available to either themselves or their staff engineers and computer systems specialists.

Concept Mapping

As mentioned earlier, the brainstorming exercise which was based on the interview data and which involved only members of the collaborative research team, yielded a total of 47 items thought by the team to be associated with PDP success. The team took steps to eliminate redundancy while at the same time permitting similarity across items. The sorting data ($N=9$) were then used to produce the default cluster solution. This solution contained 9 clusters of items per cluster with the number of items ranging from 3 to 8. These data were examined closely by the research team. Each cluster was considered in terms of its composition (cluster listing of items), importance ratings (individual items and cluster averages) and bridging index (individual item and cluster averages). The bridging index, which

Table 5.1 Items and Descriptive Statistics by Clusters in Final Solution (Cluster statistics in bold font; Cluster ranking in parentheses)

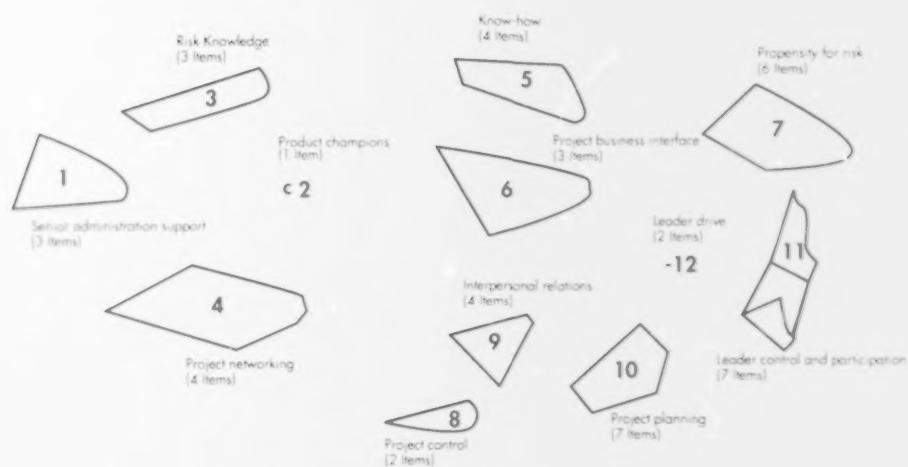
Item No.	Item Stem	Mean Importance Rating		Bridging Index	
Cluster 1	Senior administration support (3 items)	2.15	(12)	0.61	(10)
1.	Criteria to abandon projects	2.67		0.82	
43.	Professional network	2.00		0.61	
42.	Knowledge of when to reactivate shelved projects	1.78		0.39	
Cluster 2	Product champions (1 item)	3.20	(9)	0.69	(11)
18.	Product champions	3.22		0.69	
Cluster 3	Risk knowledge (3 items)	3.33	(8)	0.49	(8)
23.	Assessment of development risk	3.22		0.59	
25.	Knowledge of customer needs	4.22		0.40	
28.	Knowledge of market	2.89		0.38	
Cluster 4	Project networking (4 items)	3.11	(10)	0.81	(12)
6.	Relationships with mentors	2.33		1.00	
15.	Capable support functions	3.56		0.80	
10.	Selection and management of contractors and suppliers	3.33		0.89	
24.	Customer trust in project members	3.22		0.56	
Cluster 5	"Know-how" (4 items)	3.81	(4.5)	0.52	(9)
3.	Technical expertise	4.11		0.44	
4.	Technical experience	4.22		0.57	
33.	Knowledge of technical constraints	3.67		0.57	
37.	Creativity	3.22		0.51	
Cluster 6	Project business interface (3 items)	3.67	(6)	0.41	(5)
5.	Project management expertise	4.11		0.51	
17.	Understanding of consequences of project decisions on the business	3.22		0.40	
34.	Knowledge of non-technical constraints	3.67		0.32	
Cluster 7	Propensity for risk (6 items)	2.94	(11)	0.43	(6)
38.	Sense of adventure	1.78		0.60	
45.	Motivated by working on state-of-the-art technology	2.44		0.43	
39.	Common sense	4.00		0.28	
47.	Motivated by product quality	3.67		0.40	
40.	Tolerance for ambiguity	2.56		0.46	
41.	Obsession for excellence	3.22		0.35	

Table 5.1 Continued

Item No.	Item Stem	Mean Importance Rating		Bridging Index	
Cluster 8	Project control (2 items)	3.89	(2)	0.47	(7)
2.	Regular reviews using explicit metrics	4.44		0.31	
22.	Unity of command	3.33		0.64	
Cluster 9	Interpersonal relations (4 items)	3.81	(4.5)	0.13	(3)
7.	Good interpersonal relationships among team members assessment of market risk	4.33		0.12	
9.	Trust among team members	4.22		0.12	
26.	Small-sized teams	2.44		0.10	
21.	Appropriate project staffing	4.22		0.18	
Cluster 10	Project planning (7 items)	3.83	(3)	0.02	(1.5)
8.	Clearly defined roles and responsibilities	4.33		0.03	
44.	Utilization of project team member skills	4.11		0.01	
20.	Continuity and flow of project activities	3.11		0.05	
11.	Clear sequence of project activities	3.78		0.00	
14.	Clear milestones and deliverables	4.44		0.00	
12.	Estimate of project costs	3.11		0.03	
13.	Estimate of project duration	3.89		0.03	
Cluster 11	Leader control and participation (7 items)	3.57	(7)	0.20	(4)
16.	Ability to redefine personal roles and responsibilities	3.11		0.21	
27.	Coaching project team members	3.00		0.17	
35.	Attention to detail	4.00		0.27	
46.	Quick evaluation of issues/problems	4.22		0.27	
19.	Power to make decisions	4.00		0.28	
29.	Complete awareness of the project	3.33		0.10	
31.	Early involvement of team leader in the project	3.33		0.13	
Cluster 12	Leader drive (2 items)	4.06	(1)	0.02	(1.5)
30.	Energetic project team leader	4.00		0.02	
32.	Hard working project team leader	4.11		0.02	

ranges from 0 to 1.0, indicates the extent to which agreement on assignment was evident in the sorting data. According to multidimensional scaling criteria a low bridging index value is generated for items assigned consistently across respondents).

Throughout this process, some clusters were relatively easily interpreted by the team, while others were more challenging. For the latter, the team observed the effects of dividing clusters into subclusters, a feature of the scaling program. The subclusters were then evaluated for their interpretability and substantive meaningfulness. This process led to a final solution of 13 clusters, although conceptually one of the cluster divisions did not make sense and was therefore eliminated. The final solution appears in diagrammatic form in Figure 1 and the cluster listing complete with individual and cluster averaged importance ratings and bridging indices appear in Table 5.1.



Note: Cluster 11 was constructed by recombining two of three subclusters resulting from the division routine. While mathematically the concept mapping software was unable to recombine in this fashion, substantive wisdom suggested this to be the most logical alternative.

Figure 1 Final cluster solution

The concept map appearing in Figure 5.1 has several interesting patterns. First, Table 5.1 reveals that both the importance ratings of the manager participants and the bridging indices calculated on their sorting responses are correlated (Spearman $r = 0.66$, $p < .001$). While these indices are theoretically independent of one another, the present respondents attributed greater importance to those items that were classified similarly over sorters. Second, as supported by the descriptive data in Table 5.1, clusters appear to vary in importance and definitional properties (bridging index value) as one moves from the south-eastern region of the concept map (high importance and classification similarity) to the north-western region (low on both dimensions).

Third, the geographical dispersion of items and therefore clusters suggests relational properties among them. Relative position is important in this respect as opposed to specific vertical and horizontal coordinates. Three particular groups of clusters are noteworthy. In the south and eastern regions of the map, clusters correspond to attributes of the leader (clusters 7, 11, 12, 10 and 8). These attributes include the project team leader's drive, sensitivity to planning and project detail, project control, participation in project activities and disposition toward risk. These clusters were among the best defined and were rated on average as being most important to PDP success. Clusters 5, 6 and 9 and to some extent 7 and 10 correspond to characteristics of the project itself and its team members. In addition to project planning aspects and propensity to take risks, project team characteristics that were identified as being linked to project success include interpersonal relations among team members, connectedness with the external market, and technological knowledge and expertise.

These clusters received from the managers moderately high ratings of importance to project success. In the western region of the concept map four clusters received relatively low importance ratings. These could be grouped as factors and dimensions external to the PDP knowledge of development and market risk and support from both senior management and various support functions. Knowledge of customer needs was rated as the most important of the items in this group of clusters.

Framework Construction

Having identified these patterns in the responses of the manager participants the foundation for the construction of the conceptual framework had been laid. The time had come to draw upon the collaborative research teams interpretive capacity and knowledge of the product development literature in order to adapt the raw concept map into a meaningful conceptual formulation. Building on the three groupings of clusters described above and capitalizing on the use of the PDP as the unit of analysis, a draft graphic version of the conceptual framework was formulated by constructing boundaries around the PDP and locating

attributes such as characteristics of the PDP team, attention to detail and project planning considerations within them. Directly influencing each of these was input from the team leader in terms of interactions and exchanges with the PDP team and participation in detailed planning activities. The team leader is also seen to have developed a working relationship with customers as has the team itself. A host of other external components are seen to influence team productivity. These include mentors, suppliers, support functions, support from senior management and interconnections among members of the professional network. The draft representation of the framework was constructed by holistically sketching out the model and then assigning items from particular clusters to various components of the framework and to arrows describing the relationship among components. All of the 47 items were accommodated in this way. Having constructed this comprehensive draft representation, research team members were then able to refine the model by giving explicit and detailed consideration to both the components in the framework and relationships among them. The product of this process is the refined or derived conceptual framework for PDP success. This framework appears in Figure 5.2.

The diagram in Figure 5.2 is an object-based representation that includes actors, work objects and associations between actors and work objects. The rounded rectangles refer to attributes of the actors and work objects while the square rectangles refer to the work objects themselves. Interrelationships among actors and work objects are shown by connecting lines. Where differential and identifiable reciprocal influences were noted, double arrows are inserted. Otherwise, the lines represent direct (as with Team Leader to Team) and indirect (as with Executives to Team, Detail and Plan through Project) relational effects.

The team leader, then, is cast as being pivotal to project success through direct influence on the PDP team, attention to project details and indirect involvement in project planning. The team leader must be a high driver and risk taker and he or she must maintain sustained participation in project decision making and control strategies. The team leader provides both direction and evaluative feedback to the team. He or she also has good knowledge of customer needs the result of which is increased trust by customers in both the leader and the PDP.

The PDP team must have clearly defined roles and adequate skill utilization all of which is integrated through good interpersonal relationships. Technical know-how is essential but is buttressed through elements of creativity and risk propensity. As is necessary for the team leader, the team itself must understand customers and their needs and customers must ultimately have trust in the team. In order for PDP team to function effectively a solid plan must be formulated with unequivocal intermediate goals associated with product development as opposed to marketability. Finally, in addition to support from customers for PDP activities, the project must be supported by senior administration and various support functions emanating from the professional network.

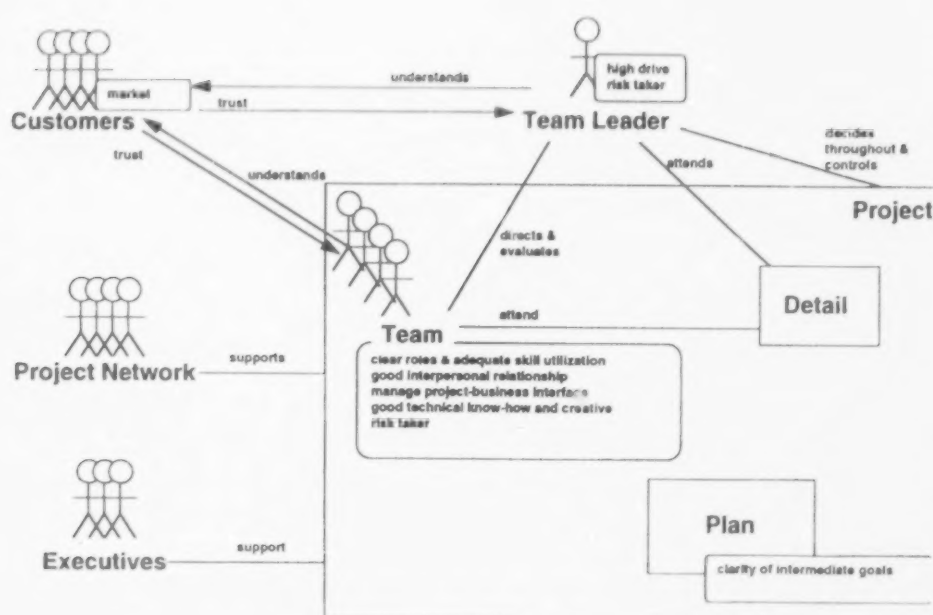


Figure 5.2 Refined model of product development project success

Discussion

The present study was designed to supply a first step toward a longer term goal of developing and validating instruments, strategies and procedures for the evaluation of management training in technology-based companies. A collaborative work team which included researchers from education, engineering and business specializations and practitioners located in a technology-based company participated in carrying out an empirical approach to developing a conceptual framework that would be useful as a guide to meeting the project's longer term objectives. An adapted approach to the usual concept mapping procedures permitted the integration of wisdom of reputationally successful technology-based directors and managers with that of the collaborative research team. The resulting product, the refined conceptual framework for PDP success appearing in Figure 5.2, now provides the basis for the formulation of instruments and strategies for training evaluation. The framework fits well

within current perspectives in the product development literature (Clark & Fujimoto, 1991; Clark & Wheelwright, 1993). This object-based representation supports the utilization of the PDP as the appropriate unit of analysis for organizational learning and adequately accommodates important conceptual components identified in that literature including leadership, communication, social interaction, planning and reflection, and attention to changes in the environment (Fiol & Lyles, 1985; Huber, 1991; Levitt & March, 1988). Using the PDP as a unit of analysis not only facilitates the development of specific objectives for training, it also permits up-front targeting of expected returns on the investment of training defined in non-monetary terms. This in turn, highlights the awareness and congruence between training and business goals and assists in clarifying strategies to ensure their achievement.

This conceptual framework now opens many possibilities concerning next steps for the longer term project; to develop new instruments, strategies, and procedures for evaluating management training that reflect the key elements for project success described by managers in our conceptual model. It could be used, for example, as a conceptual basis to develop a rating instrument that might be employed by PDP managers and management trainees to assess the development and productivity of their own projects. This sort of scale could be subjected to routine pilot testing and validation procedures. Secondly, it could also be used develop interview guides. While interview and other qualitative procedures are comparatively costly from an implementation point of view, the framework would help reduce the likelihood of being overwhelmed by only peripherally useful information and enable the implementation of strategies to ensure validity (Miles & Huberman, 1994). Potentially qualitative data could even be quantified, although processes needed to accomplish this task are also likely to be expensive. A third alternative would be to develop multidimensional profiles of PDP performance that take each dimension (e.g., team leader, team, detail, project, plan) and express them in behavioral levels ranging in manageable steps from typical but competent performance to exemplary performance. Such profiles have been used extensively in educational organizations for curriculum and program evaluation (Leithwood & Montgomery, 1987) and staff supervision (Cousins, 1991). Conceivably, quantitative data could be derived from such instruments in order to improve the feasibility of use. Psychometric properties could also be examined and accuracy improved. A fourth possibility would be the development of what Clark and Wheelwright (1993) refer to as the project audit, a systematic procedure for developing data on the PDP's characteristics and performance. Instruments for conducting project audits might also be based on the framework developed in the present study thereby establishing criteria for assessing, reviewing and directing the behavior of individuals involved in the project team.

While organizational learning theoretical principles and perspectives provide a seductive framework for thinking about the impact on organizations of training in ways that

depart from the limitations of strict econometric models, the problem of operationalizing impact is one that has not yet been laid to rest. The present utilization of concept mapping has moved us one step closer to this goal. The present research program will continue to build on this early work by developing, field testing and validating instruments and mechanisms for evaluating training transfer. While this task will undoubtedly be a challenging one, the continued reliance on multidisciplinary collaborative research teams and on empirical data from the technology-based sector shows great promise for adding to our knowledge in this area.

Appendix: Interview Guide

Date: _____ Organization: _____

Name: _____ Title: _____

Has the respondent served as a sponsor for CATM or sent staff to participate in the program?
 _____ yes _____ no

Begin session with small talk; attempt to put respondent at ease; discuss purpose of the project (to generate ideas about the impact of managerial training on organizations); obtain signed letter of informed consent and tape record with permission.

PART A: Products and services of the firm

Take care not to spend too much time on this section.

First, we'd like to start out with some general questions about your firm.

1. Describe the mission and product/service offering of your firm.
- 2.a For how many new product development projects do you have responsibility at a given time?
 _____ (#)
- b What proportion of your new product development projects are internally driven (as opposed to responses to specific external requests or demands)?
 _____ (%)
- c If we were to represent new product development projects by two main dimensions (1) newness of technology (new, standard) and (2) level of market risk (high, low), what proportion of your firm's new product development projects fall into each of the following quadrants?

New			
Technology	Standard	Low	Market Risk High

2. How does your firm identify or characterize new product development project **success**?
3. Does your firm have a criterion for **abandonment** for new product development projects?
- _____ Yes _____ No

If yes, elaborate.

PART B: Successful project

Now we'd like to talk with you about specific new product development projects in which you personally have been involved over the past few years.

1. First, think of a new product development project that you'd consider to be highly successful. Tell me the story about that project.
- a. When did it take place? Over what period of time?
- b. How many professional staff were involved? What were their roles and specializations?

- c. How important was this project within the firm? (budget, development costs)
 - d. What was your relationship to the product development team?
2. Why do you characterize the project as a success? (characteristics of the product, time to market/cycle time; revenue generation; internal and/or external integration)
3. What was it about the product development **team** that contributed to the project success (ability to work cooperatively; management skills; specialized expertise)
4. What was it about the product development **team leader** that contributed to the project success (ability to work cooperatively; management skills; specialized expertise)

5. Recall the two dimensions that we talked about earlier (technology, risk). In which quadrant would you place this project?

_____ (quadrant number, clockwise from upper left)

PART C: Second project

1. Can you think of a different new product development project that you'd place in quadrant # 2 (new tech., high risk)?

_____ Yes _____ No

IF YES: Was this project successful? Tell me the story about this project.

IF NO: Think of another new product development project that was highly successful? Tell me the story about this project.

- a. When did it take place? Over what period of time?
- b. How many professional staff were involved? What were their roles and specializations?
- c. How important was this project within the firm? (budget, development costs)
- d. What was your relationship to the product development team?
2. IF YES TO 1 ABOVE: Was the project a success? Why/not?(characteristics of the product, time to market/cycle time, revenue generation, internal and/or external integration)

IF NO TO 1 ABOVE: Why do you characterize the project as a success?
(characteristics of the product, time to market/cycle time; revenue generation;
internal and/or external integration)

3. What was it about the product development **team** that contributed to (or limited IF NO TO 1 ABOVE) the project success (ability to work cooperatively; management skills; specialized expertise)

4. What was it about the product development **team leader** that contributed to (or limited IF NO TO 1 ABOVE) the project success (ability to work cooperatively; management skills; specialized expertise)

5. IF NO TO 1 ABOVE: Recall the two dimensions that we talked about earlier (technology, risk). In which quadrant would you place this project?

_____ (quadrant number, clockwise from upper left)

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**Building Training on the Pillars:
Applying Total Quality in the Classroom**

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A major chapter in many TQM success stories is the integration of training within the total quality functions of the organization. Much has been written of the need for and importance of the human resource development (HRD) program in playing a central role in any TQM effort. What has not been emphasized as much is the need to assimilate within the HRD program the principles and practices of TQM. The notion that the instruction itself should reflect and demonstrate the desired demeanor or cultural behavior within the organization is lost on many HRD practitioners.

This paper addresses the issue of applying TQM in HRD. It begins first with an analysis of five leading TQM authors, from which four basic principles, or pillars, are derived. These pillars then serve as the basis for the application of total quality within the instructional setting. Examples are given to illustrate the relationship of the four pillars to instructional delivery. The paper concludes with implications for training gleaned from the application of the four pillars.

The Pillars of HRD Quality

The five most recognized gurus of TQM are, in alphabetical order, Philip B. Crosby, W. Edwards Deming, Armand V. Feigenbaum, Kaoru Ishikawa, and Joseph M. Juran. Individually they have molded the framework upon which present TQM practices are based. Some organizations have chosen to follow the direction of one major author while others have blended components from several authors to create a unique organizational approach. Building on the work of Voehl (1992), the authors of this paper analyzed the writings of the five TQM authors (Crosby, 1979; Deming, in Walton, 1986; Feigenbaum, 1983; Ishikawa, 1985; Juran, 1988) with the intent of identifying commonalities across authors that relate to adult learning, transformative learning, and critical reflection (Mezirow, 1990). From this content analysis emerged four common principles, or pillars of quality, which become the basis for integrating TQM with the instructional products of HRD. The pillars are discussed herein within the context of their relationship to the organization and their application in HRD.

Customer Satisfaction

One of the points on which all five TQM authors agree is that the core purpose of any quality improvement process is to ensure that the needs and reasonable expectations of the customer are identified and satisfied. The underlying assumption here is that any organization, public or private, service or manufacturing, will prosper when this occurs. Serving the customer is as straightforward as answering three important questions: Who are our customers, what do they want/need, and what must we do to meet or even anticipate our customers' needs? After identifying the customers, an organization must communicate with them to identify their needs and reasonable expectations that the organization can possibly meet. The organization must then design work processes (or modify existing ones) that ensure that these requirements are met.

To meet customers' expectations, some writers distinguish between the *internal* customer the next recipient, within the organization, of each unit's or team's service or product and the *external* customer the ultimate recipient of the organization's service or product. Thus, while many individuals and departments do not directly serve the external customer, their attention to service of their internal customers ultimately assures high quality productivity throughout the organization. This attention also ensures delivery of high quality products and services to external customers.

HRD also has a number of customers for its two basic products: instructional programs and organizational development (see Table 6.1). The internal customers of instructional programs are the learners (e.g., teams and individual employees) needing appropriate knowledge, skills, and attitudes; departments needing continuous improvement and information; and instructors and consultants needing continuous learning about both the product or service of the organization, and instructional development and delivery skills. The internal customers of organizational development are 1) the executive officers who need consultation on the maximum use of the organization's human resources, i.e., the HRD plan, and participation on the Quality Council (Lewis & Smith, 1994); and 2) the units of the organization that need assistance in the implementation of the HRD plan. Two external customers may exist for HRD: direct external customers needing training and education regarding the organization's product or service, i.e., client education, and indirect external customers seeking guidance and education on the services developed by the HRD unit (e.g., Disney seminars, Saturn programs, etc.).

Table 6.1 The Customers of Human Resource Development

Customers	Needs
Internal Customers	
Instructional Development:	
Learners (teams and individuals)	Knowledge, skills, and attitudes for organizational and personal goals; joy in learning.
Programs/departments	Continuous improvement; information exchange (input/output); cooperation; collaboration.
Instructors/consultants	Continuous learning about the product/service; competence in instructional design and delivery.
Internal Customers	
Organizational Development:	
Executive officers	Consultation and advisement; integration of HRD plan with strategic plan; participation on Quality Council.
Units/departments, divisions	Consultation and advisement; implementation of HRD plan; information exchange (input/output); cooperation; collaboration.
External Customers - Direct	
Customers/clients	Training and education in using product or service.
External Customers - Indirect	
HRD customers	Education on the HRD products and/or services developed by the HRD unit.

Continuous Improvement

Continuous improvement is both a commitment (continuous quality improvement or CQI) and a process (continuous process improvement or CPI). The Japanese word for this second pillar is *kai-zen* and is, according to Imai (1986), the single most important concept in Japanese management. The commitment to quality is initiated with a statement of dedication to a shared mission and vision and the empowerment of everyone to incrementally move toward the vision. The process of improvement is through the initiation of small, short-term projects and tasks that collectively are driven by the achievement of the long term vision and mission.

The application of continuous improvement within HRD takes place in two ways. The first is when learners acquire and practice new behaviors, processes, and skills both within the instructional setting and back on the job. The second is when HRD personnel undertake to continually improve the design and delivery of instruction to enhance the learning process. In other words, HRD helps its learner customers to acquire the skills and knowledge to continuously improve their own processes, and at the same time continuously improves its own processes.

The process for continuous improvement, first advanced many years ago by Shewhart and implemented by Deming, is plan, do, check, act (PDCA), a never-ending cycle that is used widely. The PDCA cycle can also be used in the development and delivery of instruction. Although there are no rigid rules for carrying out the process, the nature of each step in the context of instructional development can be described. *Plan* asks such key questions as what changes are needed, what are the needed results, what obstacles are to be overcome, what data are available, and what new information and skills are needed? In other words, what should the change look like? *Do* is the implementation of a small scale change based on the planning done in the previous step and done to provide data for answers about whether the change will, indeed, improve the situation. In training, an instructional program may be pilot tested to see if human performance is changed in the necessary direction. *Check* is the collection of data and the assessment of the effects of the small scale change or pilot test. *Act* first asks if the data confirm the intended plan, if there are other variables influencing the plan, and if the risks of going on are necessary and worthwhile. Then, based on the answers to these questions, the project is modified and moves into the *Plan* stage again, and the next iteration continues, expanding knowledge and implementing further learning. Ideally this process would continue indefinitely in the case of HRD, during instruction and afterwards on the job. Some would argue that systematic instructional design models embody the PDCA cycle.

Speaking with Facts

The third pillar, speaking with facts, is somewhat misnamed because its application goes beyond just talking. We include here its corollary, management by fact, for the TQM authors give it two meanings. First, data must be collected so that valid conclusions may be drawn. Second, decisions, including those made by management, should be based on those same facts. The idea behind this is that "shooting from the hip", i.e., making decisions without information, or deciding on the basis of influence, hearsay, or preconceived notions is an undesirable state.

In HRD, speaking with facts consists of collecting data upon which HRD strategies are developed, and using factual information in the instructional process. Valid data are collected through various means before, during, and after the instructional intervention. While the need for data collection is usually acknowledged in HRD, the process is often short-circuited with, for example, programs being implemented with minimal justifiable needs analysis data. The implementation of continuous improvement is an appropriate framework within which ongoing data can be collected, however. Questionnaires, interviews, focus groups, validated scales, benchmarking, and environmental scanning are all appropriate means of collecting both qualitative and quantitative data. Effective tools for analyzing data are also available. Lewis and Smith (1994) identify 21 tools, including the original seven basic quality tools (fishbone diagram, checksheet, control chart, histogram, Pareto diagram, run chart, and scatter diagram).

Using factual information in the instructional process involves obtaining applicable data to determine the knowledge gained and skills learned and applied. These data should also be collected before, during, and after the instruction. Before each time the course or program is offered, specific data on needed knowledge, skills, and attitudes can be gathered through questionnaires and guided interviews with the targeted learners. During the training, data on both concepts learned and perceptions of the learning process should be periodically gathered and analyzed, then shared with the learners. Of critical importance is the need for flexibility within the instructional process to modify the content and delivery to accurately reflect the instruction needed and desired by the learners. Following the course, periodic data can be gathered back on the job to validate the instruction as a contribution to the learners' improved productivity and their positive attitudes about the organization, their work, and themselves. These data can also be used to further enhance the overall instructional program. Examples of some of these techniques are described in a later section of this paper.

Respect for People

Respect for people, the fourth pillar of TQM that applies to training, is the acknowledgement that, while people work at an organization, they work for themselves, trying to create a meaningful and satisfying life. Recognition of this by the organization results in a work atmosphere that includes, according to Lewis and Smith (1994):

- a. Creating a sense of purpose in the workplace so that people are motivated to do their best.
- b. Keeping people informed and involved, and showing them how they are a part of the bigger picture.
- c. Educating and developing people so that individuals are the best that they can be at what they do.
- d. Helping people communicate well so they can do their jobs with peak effectiveness and efficiency.
- e. Delegating responsibility and authority downward so that people are not just doing what they are told, but are taking the initiative to try to make things work better.

In HRD, respect for people includes two groups of people the learners (employees) and the instructional staff of the organization. While the learners are also recognized as customers, the respect, caring, and support described above also applies to them as learners. For example, creating an instructional environment that facilitates self-directed learning and risk-taking encourages respect for learners. Similarly, recognition and respect for the HRD staff can result in more effective learning experiences and enhanced productivity for the organization. Examples of this respect include the following: 1) HRD staff participation in the strategic planning process, 2) HRD staff formulation of an organizational HRD plan as part of the strategic plan, and 3) organizational support of the HRD plan with the necessary resources.

Classroom Application of the Pillars

A primary premise of this paper is that if an organization is incorporating the pillars of TQM, it must also implement within its HRD unit those same principles where relevant. Following the derivation of the four training pillars, the next task was to develop or identify existing process strategies for actualizing the pillars in training. Thus, the question can be asked, what examples or illustrations are there, if any, of the instructional application of the four pillars?

The first instructional applications were in two university courses taught by two of the authors. While the schedule followed a traditional pattern of 15 weeks with one class meeting each week for three hours, the content provided the opportunity to develop and apply the principles. One was an introductory course in HRD and adult education; the other was a course on implementing TQM. In the pilot efforts a number of strategies, activities, forms, and other documents were introduced and refined and are now being implemented as instructional components in various organizations' HRD programs, e.g., a 20 session health care management course that is conducted in area hospitals. The ten components reflect one or more of the four pillars. They are listed below, using the following coding scheme: CS = customer satisfaction, CI = continuous improvement, SF = speak with facts, RP = respect for people.

The components:

1. A complete study guide for the course is prepared listing the objectives, session outline and schedule, and related materials and readings by session. (CS)
2. A background sheet is completed by each learner, ideally prior to the first session or at the beginning of the first session. The information is summarized and an expanded class roster is distributed to the learners. (CS, RP)
3. A bi-weekly feedback questionnaire is administered to determine the learners' perspective of the process, content, and pace of the course. (CS, CI, RP)
4. A Quality Council is created, consisting of a representative from each of the small groups that are formed near the beginning of the course. The Council, which meets every two weeks, provides feedback from the bi-weekly questionnaires their group members completed. Based on their input, the course is modified to address areas of knowledge or skills not adequately covered, to slow or quicken the pace of delivery, and, in general, ensure that the needs of the learners are heard and acted upon. Membership on the Council is on a rotation basis with the order of representation determined by each group. This is done in order to have multiple representation on the Council and not overburden specific individuals with Council membership tasks throughout the course. (CI, SW)

5. In the first or second session each person is asked to complete an *Individual Strategic Plan for Personal Continuous Quality Improvement*, a three-page questionnaire asking individuals to 1) identify the kind of learning experience they like most/least, 2) prepare a personal mission and vision statement, and 3) describe how this course relates (or does not relate) to that statement. These plans are reviewed by the instructor(s) and the course is adjusted as much as reasonably possible to facilitate learner's realization of their stated visions. (CS, RP)
6. A variety of small group activities are done in the first three sessions. Some of these groups are formed by the participants and some by the instructor(s). Learner-formed groups are done to observe both the processes (ease of forming groups) and the products (e.g., do the same people always group together?). The instructor-formed groups are structured so that learners meet previously unknown people in the class. (RP)
7. After approximately three sessions, permanent groups are formed through a consensus process involving the learners and the instructor. During this process a major part of one session is devoted to the meaning and purpose of teams, the difference between groups and teams, and the intent that the groups being formed will develop into teams. (CS, RP)
8. Heavy emphasis throughout the course is placed on experiential exercises and participative activities through which the course content (knowledge) is examined and discussed, and desired skills are learned and practiced. For the most part, all exercises and activities are done within a small group format. (RP)
9. Use of case studies, both published (e.g., *Lost on the Moon*) and those drawn from the organization's experience are an integral part of the course to provide more realistic performance assessments, and assessments of learners' skills and knowledge (hopefully improved) back of the job by their supervisors. All case studies are done in the small group format. (CI, SW)
10. Feedback to each person and each team is provided throughout the course by other learners and by the instructor(s). This is provided as written and oral feedback and informal encouraging and supportive comments. An example is the videotaping of key presentations of the teams and feedback on performance by the participants and the instructor(s). (CI, SF)

Conclusions and Implications

It is the authors' experience that when learning is built upon these four quality pillars, four outcomes consistently occur. First, the entire course is highly experiential and interactive. The learners are engaged in prepared instructional activities and they are asked to bring their experiences to bear on the content at hand. Adjustments are made to the course content and delivery is based on the participants' collective input.

Second, the content of the course is continuously focused on performance outcomes. The content determines the specificity of the behavioral performance following any learning experience. For example, specific performance is more readily observed for a technical course such as computer skills, than for a broader, less technical course such as health care management. Nevertheless, many students try to apply the skills and knowledge learned even as the course progresses. Thus, more data, upon which are made course improvement decisions, are available to the instructor more often.

A third result of this entire process is that no two human resource development programs/activities are exactly the same. With the implementation of these four pillars, the resulting instructional program reflects both the immediate needs and the dynamics of the group which is comprised of unique human beings at a unique point in time. Directly replicable instruction is neither desirable nor achievable in this case.

Fourth, this approach, when applied within organizations is not viewed as a separate entity, but within the systemic framework of the organization. The TQM that is taught to employees and management is also practiced within the HRD unit. While the content (knowledge and skills) may be established at times, the determination of its delivery and the selection of the learners must be done within an overall plan (the HRD plan) that complements the mission and vision of the organization. Performance technology and TQM are co-advocates of "just-in-time" training to assure that training is both needed, optimally received, and applied back on the job.

The implementation of these pillars has consequences and implications for the HRD unit which it must be prepared to deal with if it is to be implemented successfully. The first implication regards data collection and use. Once they have been exposed to this approach, people who may have thought of themselves in previous training as employees or learners, now see themselves as customers with needs and desires to satisfy. Learners thus articulate their requirements with the expectation that these will be met sometime during the training. If the instructor has no intention of using these requirements and subsequent data regarding their satisfaction, then more harm than good may be done by asking learners for their input. A corollary to this is for the instructor to ask only for the type and amount of data as he or she can reasonably use during the course. For example, the authors had originally thought that feedback

questionnaires on a weekly basis would be optimum. It was quickly realized that this would not work for two reasons. First, two sessions provided a more complete chunk of instruction to reflect upon. Second, the authors wanted to emphasize quality over quantity and did not want the questionnaire to become mundane something learners felt they had to fill out so they could leave the room at the end of class.

The second implication involves modification of course content and activities. False expectations can be created if there is no opportunity to change instruction during the course or the instructor does not have the ability to make the changes. Instructors must be able to think on their feet during sessions as well as between sessions to make appropriate course adjustments implied by the data. Thinking on one's feet is facilitated by adequate feedback sources. With them, the instructor pays attention to the learners' actual concerns, not what he or she thinks they might be by reading facial expressions in sessions.

Third, skill in managing small instructional groups is essential for ensuring the success of experiential learning for much of it is done in teams of four to eight people. Instructors who are used to lecturing to or demonstrating skills in front of a large group and instructors who work mostly one-on-one may be less than effective unless they consider and acquire the instructional skills necessary to manage small learning groups.

TQM has impact on training beyond the mere increase of courses and workshops to prepare a workforce for the quality journey. It can change the way design and delivery of instruction are viewed and carried out. Certainly there are more ways of incorporating the four training quality pillars in the HRD process. These ways will be increased and refined as more HRD units accept the challenge.

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Z

**Personnel Job Involvement and Organizational Climate
Affect Transfer of Acquisition**

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Within the field of Industrial Relations, for the past two decades, researchers have studied the psychological variables related to the transfer of acquisitions as in learning, attitudes and behaviour and the effects of the transfer of training. The two important factors that could affect the transfer of behaviours to job performance are the perceived influence of the work environment associated with the organizational climate and the work involvement of employees as reinforcers to perform the desired tasks on the job. The purpose of this study is to discuss the outcomes pertaining to the training program in conjunction with personnel characteristics and the organizational climate affecting the transfer of training in order to explore the nature of the transfer process. The participants of the study were managers and workers of a service oriented enterprise (N=75) who responded to questionnaires measuring knowledge and behaviour as well as job involvement and organizational climate. They responded both, before and after attending a "Moti-ventes" training program for stimulating sales. In reference to Kirkpatrick's (1959) multi-level model of training evaluation criteria, the preliminary results show that organizational climate and job involvement are positively related to the desired acquisition, retention and behavioural change inherently associated with job performance.

Introduction

All organizations provide training programs as a fundamental requirement for their sustained existence in our competitive world. Theories of transfer of training are crucial for understanding the learning of employees. Psychologists have studied the learning of individuals for many years and are still a long way from fully understanding the workings of the human mind. Likewise, the theory of transfer of training is still in the preliminary stages of development; according to Georgensen (1982), only 10% of training investment is translated into behavioural change and consequently affect the trainee's work.

Transfer of training method

Baldwin and Ford (1988) defined transfer of training in terms of two conditions of transfer. Firstly, the maintenance of learned material over time (retention) and secondly, the generalization of learned material (behavioural change). Adams (1955), qualified generalization as the extent to which knowledge, skills and attitudes acquired in training are

utilized in different tasks or in settings beyond the training context. In reference to the literature, most empirical studies were limited to simple motor or verbal skills training. For this reason, in the last decade or so,

as researchers have changed focus, more attention has been paid to the inclusion of different aspects of training programs in that attempts have been made to integrate training in strategic planning and to evaluate training needs; objectives; content; learning methods and learning media; individual capabilities of trainees; the conditions of learning; and the subsequent training outcomes.

The study will focus on two aspects for evaluation of the training program measured by pre- and post-tests. Firstly, the conditions of learning refer to the variables of job involvement and secondly, of employee commitment. The training outcomes refer to the comparison of learning and performance which result in the actual impact of the training program on the organization.

Review of the literature on evaluation of training program

In studying the literature, it has become apparent that researchers conduct studies based only in specific domains, that is, areas pertaining to their field of expertise. To illustrate contributions on training program evaluation, three main sources have been identified in the literature: a) the training and development associated with industry (*Journal of the American Society of Training and Development*); b) the training and development at the scientific level (*The Personnel Psychology* and *The Journal of Applied Psychology*); and c) training and development in reference to learning and human performance (*Annual Review of Psychology* and *International Review of Industrial and Organizational Psychology*).

Given that Canada and the United States invest billions of dollars in training and development programs, very few studies have been conducted, namely, those of Campbell, (1971); Goldstein (1980); Latham, (1988); and Wexley (1984) and equally few reference texts as those available by McGehee and Thayer (1961); Bass and Vaughan (1966); Wexley and Latham (1981) and Goldstein (1986).

Gagne and Rohwer (1969) conducted one of the first studies on the process of learning and the effect of training programs. Subsequent studies were conducted by Glaser and Resnick (1972); McKeachie (1974); Wittrock and Lumsdaine (1977) Resnick (1981) and Gagné and Dick (1983).

The theory of cognition, developed by Gagné in the early 1960's, has been recognized as a major contribution to the conception and development of training programs.

McGehee and Thayer (1961), described three aspects of training needs: organizational analysis, task analysis and individual analysis. In the mid 1970's, Ammerman and Pratzner (1974, 1975, 1977) explored the use of knowledge, skills and attitudes as factors for analysis in training systems as well as a methodology for task analysis in job descriptions and based on this assumption, the need for training was acknowledged as a requirement; although Wexley (1984), Goldstein (1986) Prien and Goldstein and Macey (1987) discovered that task analysis could not be considered as the only indicator for the need of training programs.

In the 1980's, empirical studies were conducted in order to evaluate the quality and impact of training programs (summative evaluation) by considering the assessments of personnel. Some researchers based their studies on the methods (instructions, models or trainer skills) in managerial training programs and in general administration (Burke and Day, 1986); and others on behaviourist models (Decker and Natham, 1985) and still others on T group models (Campbell and Dunnette, 1968).

Researchers for the most part have evaluated training programs based on eight (8) major aspects; a) integration of training in strategic planning -organizational design (French and Bell, 1984); b) evaluation of training needs -general needs (Wexley and Latham, 1981; Wexley, 1984; Goldstein, 1986; and Latham, 1988) -managers' needs (Powers, 1987; Lombardo, 1989; Whetten and Cameron, 1988; Yukl, 1989; Yukl and Lepsinger, 1991); c) evaluation of training objectives, behaviour, cognitive skills, verbals learning, motor skills (Mager, 1975; Gagné and Briggs, 1979); d) evaluation of training content, knowledge and skills (Fiedler and Chemers, 1984); resolution of problems (Brandsford, Sherwood, Vye and Rieser, 1986); e) evaluation of learning methods and learning media -development of methods and techniques (Pintrick, 1986); retention of learning (Perry and Downs, 1985); f) evaluation of individual capabilities of trainees -individuals and the programs (Cronbach and Snow, 1977; Snow and Lohman, 1984; Pintrick, Cross, Kozma and Mckenzie, 1986); self-efficacy (Vroom 1973; Weiner, 1979; Bandura 1977, 1982; Frayne and Latham, 1987); motivation (Latham, 1988); research and development (Pearson and McCauley, 1991); schools (McCauley, 1990); g) evaluation of the conditions of learning -goals (Snow and Lohman 1984; Baldwin and Magjuka, 1991); careers (Wright and Werther, 1991); reinforcements (internal and external) (Blum and Naylor, 1968; Locke, 1980; Lindsey, Homes and McCall, 1987; Lombardo, 1989; Whitley 1989); h) evaluation of the training outcomes -peers (Yukl, Wall and Lepsinger, 1990; Yukl and Lepsinger, 1991); benchmarks (Clark and Clark, 1990).

This study focuses on two aspects of the training program: the conditions of learning which refer to trainee job involvement and organizational climate; and the training outcomes which refer to the comparison of trainee learning and performance which is directly affected as a result of the training program.

In the literature, researchers have focused upon the evaluation of transfer based on two main concepts: goal setting and behavioural self-management. Locke (1980)

refers to goal setting as an effective motivational strategy for inducing behavioural changes in a wide variety of tasks. In this respect, trainees should be assigned specific behavioural goals upon returning to their jobs. Luthans and Davis (1979) define behavioural self-management as "deliberate regulation of stimulus cues, covert processes, and response consequences to achieve personally identified behavioural outcomes". Furthermore, a recent review of the literature conducted by Baldwin and Ford (1988) revealed that most investigations of training success have measured the learning that has taken place at the end of the training program as opposed to subsequent on the job performance. Therefore, in order to better understand training transfer and behaviour change on the job, evaluation was conducted by way of paper and pencil tests and by actually evaluating the specific behaviours in the work environment. The "Moti-ventes" training program was given to personnel working at four different regions. However, despite the distance between the regions and given the similar type of service offered, the working environment remained largely the same. An evaluation was conducted in order to determine what knowledge, skills and attitudes were learned, and the degree to which transfer of training has occurred.

Method

The participants of this study include 75 employees working in 38 branches across the province of Québec. The training program was administered to all of the employees working in the various locations of the service oriented company. For this study, the program was administered at four locations: Amos, Hull, Outaouais and Montreal. The training program was introduced to eleven employees designated as group 1 (Amos), nine employees designated as group 2 (Hull), fourteen employees designated as group 3 (Montreal), twenty-one employees designated as group 4 (Outaouais) and twenty employees designated as group C (Montreal-Head Office). The groups were selected by region totalling 55 (73%) males and 20 (27%) females. The participants (58%) held branch administrative occupations namely, managers, assistant managers and senior clerks. The remainder of the subjects (22%) were technicians, computer operators, designers and accountants. The largest proportion of participants with the greatest length of service amounted to 41 (54%), and represented between 16 and 25 years of experience. Only 4 (5%) participants had more than 25 years experience. The age ranged from 24 to 60 years old whereby 54 (75%) were between 31 and 50 years old. High school and college graduates represented 76% of the participants.

The training program "Moti-ventes" designed and developed jointly by Robert Coppenrath and Associates, specializing in management training, was employed. The four day training course involved 21 hours and comprised of six modules: a) sales, b) customer needs,

c) sales opening, d) gathering information; e) sale suggestions, f) conflict management. The course content was adapted to reflect the ideology of La Société des alcools du Québec which is comprised of nine 9 customer service norms. Instructional methods included exercises, group discussions, and four live modelling sessions, lasting 10 minutes per session. The video sessions illustrated the use of certain communication skills and various attitudinal strategies for use with different customers.

The trainees received the book and a handout outlining the objectives of the course and the major learning objectives. At the end of the course, the trainees were asked to complete a reaction assessment form and a complete written learning assessment with regard to knowledge and attitudes. The questionnaires presented to the trainees were developed by the researcher according to the objectives of the program and were co-verified by three experienced instructors.

Research design

In the literature, there exist many types of training evaluation. In order to be able to discuss the application, its value and to monitor the various evaluation techniques, it was necessary to organize different types of evaluation within a framework.

The application of a four-tiered hierarchical criteria comprising of attitudinal, comprehension, action and outcome components as suggested by Kirkpatrick (1959), provided a general basis for evaluating training within industrial job training programs.

Kirkpatrick summarized the different types of evaluation into four major categories:

1. Level I Reactions
2. Level II Learning
3. Level III Behaviour
4. Level IV Results

The empirical study we conducted includes all the levels stated by Kirkpatrick, however, for the purpose of this paper, we choose to present the Level II Learning and the Level III Behaviour.

Level II - Learning

Whichever tests are used, the measures must be objective and must include quantifiable indicators of how the participant understood and maintained the learned material.

The real concern of the evaluation of training program is to find out whether or not the knowledge gained in the classroom is transferred on the actual job. The literature states that this is the most difficult part of an evaluation research, as there are no methods to

measure if the transfer of knowledge has occur, and if the transfer is directly associated to the training program or other variables influencing the performance.

Tests to measure the degree of knowledge gained are more objective and reliable than reaction questionnaires. All the literature indicate clearly that the most widely used method to evaluate learning, is the use of pre-test, post-test, coupled with a control group. This method has the advantage of measuring the level of knowledge before training is administered, and after the training takes place, as the same instrument is being used. Another benefit is to administer the test to a trained group, then to a control group selected at random, and not exposed to the training program. It is therefore feasible to measure the extent of the learning that took place and to arrive at various conclusions with regards to the content material that was provided.

The degree of knowledge gained may never be reflected in behaviour or actually used on the job, which is when the value of training really starts to have a meaning. This is where transfer of training really takes place, in the change of behaviour.

LEVEL III - Behaviour

As we have used the pre and the post tests with a control group to evaluate level - II, Learning, we chose to use the actual performance appraisal with an evaluation from observers that acted as customers in real life situations. This method was used to diminish the subjectivity from peers and was administered before the program and, eight to twelve months after the training program.

The Solomon (1949) Four-Group Design, represent the first explicit consideration of the EXTERNAL and INTERNAL validity factors. Campbell and Stanley (1969) noted 12 factors that could potentially influence the internal or the external validity of experimental designs. The internal validity factors represent the effects of history, maturation, testing, instrumentation, statistical regression, selection of respondents, experimental mortality and the selection-maturation, while the external validity factors comprise of the reactive or interaction effect, the interaction effects of selection, the reactive effects of experimental arrangements and the multiple-treatment interference. Using the Solomon Four-Group Design, the internal validity factors are all controlled and a possible source of concern exists in the external factors and were located in the (1) interaction effects of selection biases and the experimental variable and (2) the reactive effects of the experimental arrangements. Giving these potential effects and in order to mitigate the factors associated to these external sources of invalidity, we included a fifth group in the Solomon Four-Group Design. The Solomon Design has high prestige and represents the first explicit consideration of external validity factors and by adding a fifth group, we fully maximized the control of the potential sources of invalidity in a Training and Business environment.

As shown in the Table 7.1 of this study, group 1 was assigned experimental group status, receiving a pre-test before the program and a post-test after the program. Also, a second post-test was administered four months later and a third post-test followed at the end of the eighth month. Between the period of the first post-test and the second and the third post-test neither the trainees of group 1 nor their supervisors were advised of a post-test in advance. This diminished the possible effect of having participated in an experiment, therefore mitigating the Hawthorne effect. Group 2 was also assigned experimental group status and was allowed to undergo the same procedures as Group 1, but was not required to do the second post-test administered four months after the end of the training program but were administered the third post-test, eight months after the end of the training program. The purpose was to evaluate the effect of the second post-test. Group 3 was included in the training program but did not receive the pre- nor the second post-test in order to determine the transfer effect on the job task. Post-test3 was administered eight months after the training program. Group 4 was included in the training program for the purpose of evaluating acquisition without the benefit of the pre-test and the second post-test after the program. The post-test2 was administered eight months after the training program. This group also served as the additional group in the Solomon Four-Group Design in conjunction with the external validity effects. Group C served as the control group, selected randomly from a human resource data file, without the benefit of the training program. This group was excluded from the training program but was required to do the pre-test and to perform the same task on the post-test, four days after the completion of the pre-test.

The trainees were administered two series of questionnaires. These instruments comply with the criteria pertaining to the four levels of the model proposed by Kirkpatrick (1959). For reactions, seven questions were developed for responses corresponding to a five item Likert-type scale. To assess mastery of the transfer of learning and behaviour, a fifteen item questionnaire and a ten item questionnaire were developed to reflect the objectives of the training program, and to evaluate the knowledge, skills and attitudes of the trainees. The questionnaires had multiple choice and true or false sections. The factors measured as moderator variables were the personnel characteristics and the organizational climate. In addition, questions pertaining to reactions were developed and incorporated in the questionnaire, which was administered to the groups after the training program. The development of the tests took into account the 14 main objectives and the 8 goals of the training program. Firstly, all of the objectives and goals were defined as this is crucial in determining what to evaluate with regard to learning and job performance and ultimately the impact on the organization.

In order to meet the criteria proposed by Cantor (1987), in constructing a valid test, the researcher participated in a three day course and met the following criteria: a) to know the subject matter perfectly well, b) to understand the target population; and c) to be a skilled communicator.

Table 7.1 List of the groups and the research instruments

Groups N= 75	Training program	Research Instruments	T1	T2	T3	T4	T5	Research Objectives
Group 1 N=11	Yes	PA1	x					1. Study the transfer learning and the degree of retention
Experimental group		Pre-tst	x		x			
		Pst-tst1		x				
		Pst-tst2						
		Pst-tst3				x		
		PA2					x	
		Rea		x				2. Identify the various effects on the transfer using CI and JIQ
		CI					x	
		JIQ					x	
Group 2 N=9	Yes	PA1	x					1. and 2. same as above group 1
Experimental group		Pre-tst	x					
		Pst-tst1						3. assess and compare outcomes without pst-tst2
		Pst-tst3				x		
		PA2					x	
		Rea		x				
		CI					x	
		JIQ					x	
								1. and 2. same as above group 1
								3. assess and compare outcomes without pre-tst for group 1 and group 2
Group 3 N=14	Yes	PA1	x		x			1. and 2. same as above group 1
Experimental group		Pst-tst1						
		Pst-tst3				x		3. assess and compare outcomes without pre-tst for group 1 and group 2
		PA2					x	
		Rea		x				
		CI					x	
		JIQ					x	
Group 4 N=21	Yes	PA1	x					1. and 2. same as above group 1
Experimental group		Pst-tst2				x		
		Pst-tst3					x	3. compare outcomes to group 1, group 2 and group 3
		PA2					x	
		Rea		x				
		CI					x	
		JIQ					x	
Group C N=20	No	Pre-test	x					1. and 2. same as above group 1
Control group		Post-test						
		CI		x				3. assess if training program is responsible of the learning
		JIQ		x				

Legend:

PA1: Performance Appraisal before the program

PA2: Performance Appraisal after the program

CI: Organizational Climate Questionnaire

JIQ: Job Involvement Questionnaire

T1: Time before training, T2: Time 4 days after training, T3: Time 4 months after training, T4: Time 8 months after training, T5: Time 12 months after training

Pre-tst: Learning Questionnaire

Pst-tst1 same as above

Pst-tst2 same as above

Pst-tst3 same as above

The first draft of the test was administered to the instructors. The questions found to be too general were removed in order to focus on specific skills: a) verbal communication (listening, questioning); b) assessing customer needs; b) providing suggestions; c) diminishing customer objections; d) and closing of sales. Three questions of the second draft were amended in order to reflect the same syntax used in the practice exercises. The same training instructors delivered the training course in the five selected regions and administered the tests with the instruction that responses be spontaneous. A cover letter assured confidentiality of the test results.

The evaluation of the transfer of training (personnel appraisal) was conducted by the firm Tannox, in that these evaluators posed as customers and proceeded to purchase wine and observed the sales process in the real life situation. The job performance of the participants was evaluated according to performance on specific tasks: a) welcome (facial and verbal expression); b) offer of services (verbal communication of information); c) approaching the product (location); d) offer of alternate products (substitution) when appropriate; and e) reply to customer inquiries.

In order to verify the validity of the learning questionnaire and the behavioural questionnaire, the norms developed by the organization were associated with every question were identified and matched with the responses.

In order to evaluate the Learning level I, we used the pre and post tests for the experimental groups and the control group.

For the Behaviour level II, amongst the available techniques to collect data stated in the literature : direct observations, self-appraisal, over the shoulder evaluation, pre-test/post-test and control group designs, we chose the direct observation technique.

The observations provide reliable evidence of training effectiveness, however it is the most costly techniques to utilize when the participants are located in various locations. Despite the high cost of the observable appraisals and the need to have the evaluation done before and after the program, we decided to use this method for collecting qualitative data.

As previously mentioned the empirical study we conducted included all the levels stated by Kirkpatrick, however, for the purpose of this paper, we choose to present the Level II Learning and the Level III Behaviour.

Results

Level II - Learning (Transfer of Learning)

As shown in the Table 7.2 below, employees demonstrated less knowledge before the training program than after the training program. An increase of 61% is observed pertaining to mean scores when comparing the pre-test results (a mean of 10,8) and the first post-test (a mean of 17,4). With the second post-test administered after nine months, a decrease of 9,9% (a mean of 15,7) in performance scores are observed. However, despite this decrease, the participants still retained knowledge from the training program. The results of the second post-test of groups 1 (15,7), 2 (15,5) and 3 (15,6) are comparable. We may predict that mastery of knowledge levels off after a four month period.

Table 7.2 Summary retention results for all groups

Groups	Mean	Std dev.	Corr.
Gr.1 Pre-test1	10,8	2.96	27.3
Gr.1 Pst-test1	7,4	2.16	12.3
Gr.1 Pst-test2	15,7	2.36	17.2
Gr.2 Pre-test1	10,5	5.27	49.9
Gr.2 Pst-test1	17,2	3.19	18.5
Gr.3 Pst-test1	15,5	3.85	24.8
Gr.4 Pst-test1	15,6	3.79	24.2
Gr.C Pre-test1	11,1	3.16	28.4
Gr.C Pst-test2	11,8	3.88	32.6

The results of Group 1 pre-test1 and Group 2 pre-test1 are lower than that of Group C pre-test1. Although Group C did not receive any training, we explain this result as largely due to the young age of the participants coupled with the higher level of education. Also, for Group C the results associated with the pre- and post-test indicate a slight increase.

Perhaps, as Rogosa, Brandt and Zimowski (1982) indicate, the difference in the mean scores is attributed to a natural and useful estimate of individual change and this slight gain is respectable in terms of the reliability of the questionnaires. We can also assume that the participants of Group 1 and Group C have the same knowledge base for the course. However, those in Group C do not work in a customer service environment and are not exposed to the sales environment. Group 3 and Group 4 scored comparably (15.5 and 15.6). Group 3 was tested four months after the training program and Group 4, eight months after the training program. The slight difference in scores may be attributed to the number of years of experience: 10 years for Group 3 compared to 17 years for Group 4.

Level III- Behaviour (Transfer of Training)

In order to discuss the application and value of the training program, we will present our preliminary results for group 1.

The norms or variables associated with training, namely welcome, customer service\discovery, communication skills and customer needs were matched to the learning questionnaire. Application of the measurement criteria (norms) to the questionnaire were used to assess the transfer of learning and the transfer of training in a comparative analysis. These behavioural standards were developed by the organization to reflect the training program and the main objectives of the training program were modified to actual behaviours for improved customer service and the offer of products, resulting in a direct impact on the bottom line of the company. The breakdown of the norms associated to the learning questionnaires are as follows:

Norm 1 - Welcome

The questions 3,9,10,23 were associated with the communication skills: behaviours and feelings, welcome, the use of open and close ended questions and the confidence climate.

When we compare the behaviour WELCOME results with the pretest, post-test 1 and post-test 2, the behaviour of the previous year and the current year slightly increase to reach 49 points as opposed to 45 points. Moreover, the results obtained from the post-test 1 were lower in score than the pretest. We can associate this result as misunderstanding of communications words to the actual behaviour.

Norms 2 and 5 - Customer service and Discovery

The questions 1,4,7,11,12,20 and 24 were associated with empathy, communication signals, customer needs, listening, the use of open and close ended questions and selective listening.

The CUSTOMER SERVICE \DISCOVERY is directly associated to the offering of the services. The knowledge obtained from the course diminished over time resulting in no correlation with all the questions 1, 4, 7, 22, 20, 24 with the exception of question 12: the

type of opening question to use when talking to the customer.

When we compare the result of this question to the behaviour of year one and year two, the result is identical. However, despite the decrease in knowledge for the other questions, the behaviour increased by 3 points, from 33 to 38.

Norm 3 - Communication skills

The questions 2,3,10,11,15,18 and 24 were associated with the proximity of the customers, verbal and non-verbal communication, suggestion and communicative feelings.

The COMMUNICATION skills referring to learning improved largely with a perfect correlation despite the decrease in retention over the period of the pre and post-test 1 and 2, a perfect correlation stand for the behaviour in time 1 and in time 2.

Norm 4 - Customer needs

The questions 6,13,15,25 were associated with the suggestion process, reluctance of buying, substitute product and additional sales.

The CUSTOMER needs referring to questions 6, 13, 15 and 25, the learning from pre-test to pro-test did not correlate (.134) however, the question associated to the definition of the word suggestion was understood with a correlation of .42. Nevertheless, the behaviour score remained the same for year one and year two.

Personnel Characteristics and Organizational Environment

Groups 1, 2, 3, 4 and the Control group responded to questionnaires pertaining to Personnel Job Involvement and the Organizational climate. The Job Involvement Questionnaire (JIQ), was a ten item questionnaire with a six point Likert-type scale measuring the perceived importance of job involvement with the present job. The Organizational Climate questionnaire, was an 18 item questionnaire with a four point Likert-type scale measuring the perceived climate within the organization. These items are used to measure human organizational intervening variables such as leadership, motivation, communication, decision, goals and control. These characteristics are measured on a continuum of a twenty point Likert-type scale measuring the profile of the organizational characteristics and divided into the four systems, ranging from System 1 located at the left end of the continuum to the System 4 at the right end. System 1 corresponds to the motivational forces that rely on punitive treatment of employees of the organization and System 4 corresponds the motivational forces that are based on supportive treatment and involvement (Likert, 1976). The Profile of Organizational characteristics was translated by the CEDEP (Centre européen d'éducation permanente).

The trainees who had performed better, thus demonstrating transfer of learning, also reflected a significant relationship between personnel characteristics and organizational climate. Trainees who reacted positively to the desired personnel characteristics and the well perceived organizational climate also were slightly better in their overall performance than the trainees who stated that they were less involved and perceived a weak organizational climate.

Discussion

The main findings of this study are twofold. Firstly, participants in the first 4 groups when compared to the control group showed a lower level of knowledge pertaining to their own jobs. We can attribute the higher level of knowledge of group 5 to higher education. Retention diminished with time but stabilized over a four month period. Secondly, the training program served to provide new skills to be applied on the job. This study indicates that a higher score in personnel job involvement and organizational climate is observed in the groups that attained a lower learning score and a higher learning score in the actual transfer of the skills on the job. Two questions arise from this finding: Can a trainee perform adequately on the job, without mastering knowledge? Can a trainee fail to perform adequately on the job, despite the mastering the knowledge?

In addition, the main objective of the training program was to alter existing attitudes to improve customer service and the actual volume of sales. Based on the five main performance items related to the transfer tasks, the welcome (facial and verbal expression) remained the same before and after the training program. The offer of services (verbal communication of information) remained the same with the exception of a 50% increase in the replies to the customer inquiries, but despite the mastery of knowledge of customers needs, only a 35% increase is reflected at the job level for offering an alternate product. We believe that this is attributed to lower level of job involvement. The best performance was encountered when the trainees walked with the customer to the product. A performance score of 80% was attained by the four groups.

The results of this study encourage practitioners to evaluate the organizational climate and the personnel job involvement prior to administering a training program. In order to further examine these findings, more studies are required in different training areas and in more varied organizational contexts, as this study was performed in a para-governmental enterprise.

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